



### Adjustment notes for apprentice and trainee estimates

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DATA COLLECTIONS AND ANALYSIS BRANCH

NATIONAL CENTRE FOR VOCATIONAL EDUCATION RESEARCH

This technical note provides a cumulative record of the adjustment notes relevant for the estimation of apprentice and trainee figures at each collection.

This document commences with the adjustment note for Collection 64 (June 2010 estimates used to produce the March quarter 2010 publication).

The views and opinions expressed in this document are those of the author/project team and do not necessarily reflect the views of the Australian Government or state and territory governments.

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# Introduction

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Apprentice and trainee data are reported by the State and Territory Training Authorities to NCVER on a quarterly basis, starting at the September quarter of 1994. The set of data submitted that quarter is referred to as Collection 1. The sets of data submitted in subsequent quarters are referred to as Collection 2, Collection 3 and so on.

NCVER publishes data on the numbers of contracts of training that commence, complete, cancel/withdraw, re-commence, expire or suspend and the time at which these events occur (referred to as the "date of effect"). From these events, the number of contracts in training at a given time can be calculated.

Due to time delays in reporting data on the status of contracts to NCVER, the most recent data are estimated. Further details regarding this methodology are provided in the technical paper produced by NCVER, *Estimation of Apprentice and Trainee Statistics*, which can be found at <<http://www.ncver.edu.au/publications/2257.html>>.

The purpose of this technical paper is to document the adjustments that are made to the estimates at each collection, and produce a cumulative document of these adjustments, commencing at Collection 60, June 2009 estimates.

# Adjustment note for collection 64

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NCVER examines the quarterly apprentice and trainee estimates produced by the endorsed model in order to check that the estimates are reasonable. In particular, a decision rule was introduced in collection 45 that mandated reviewing all estimates with relative prediction errors of 10% or more. The goal of the review is to correct for any large bias in estimation that might be caused by changes in the pattern of reporting practices over time. Note that whilst an estimate might be adjusted for bias, its associated prediction error is not altered.

Commencement estimates in the Australian Capital Territory for March quarter 2010 and December quarter 2009 were associated with relative prediction errors over 10%. In South Australia, the completion estimate for March quarter 2010 had a relative prediction error over 9% and was also reviewed.

The relative prediction errors for expired contracts remained typically high although much reduced from the levels experienced in past years. In particular, both NSW and Victoria are under 10% and the highest value is about 25%.

The contribution of expired contracts to the in training estimate is usually small both in level and variation. High relative errors appear to be explained to some degree by the fact that the estimates are small numbers and therefore any variation is relatively large. Adjustments to the estimates of expired contracts have little effect on the corresponding estimates of in training. Consequently, no alterations to estimates of expired contracts have been made.

## **South Australia**

### Completions for the March quarter 10

From endorsed model – Estimate = 3537; Relative Error = 9.41%.

Time window for calculating average lag factor is from June 2007 quarter to March 2009 quarter.

The lags in the time window do not display any pattern which could be used to justify altering the estimate from the model (refer to Figure 1 in Attachment 1). The next two quarters after the time window appear low but they can be expected to increase over the next two quarters.

No revision.

## **Australian Capital Territory**

### Commencements for the December quarter 09

From endorsed model – Estimate = 922; Relative Error = 13.30%.

Time window for calculating average lag factor is from June 2007 quarter to March 2009 quarter.

The lag for the first quarter in the time window is clearly higher than the others (refer to Figure 2 in Attachment 1). Lags for quarters 2 to 8 display a relatively flat line. These lags have been used as the basis for the revision of the estimate.

Revised Estimate = 882

### Commencements for the March quarter 10

From endorsed model – Estimate = 1916; Relative Error = 14.77%.

Time window for calculating average lag factor is from June 2007 quarter to March 2009 quarter.

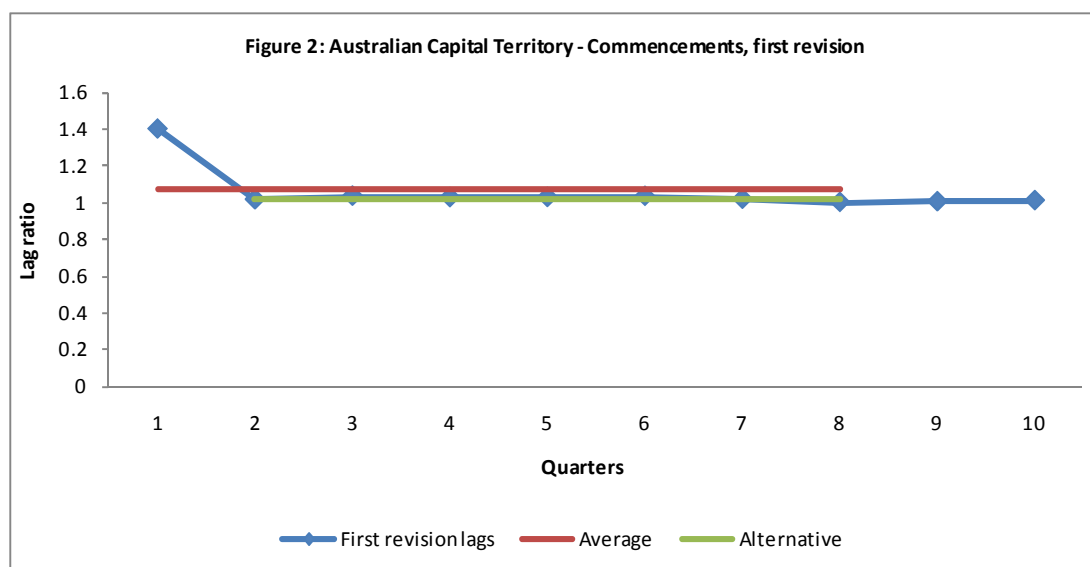
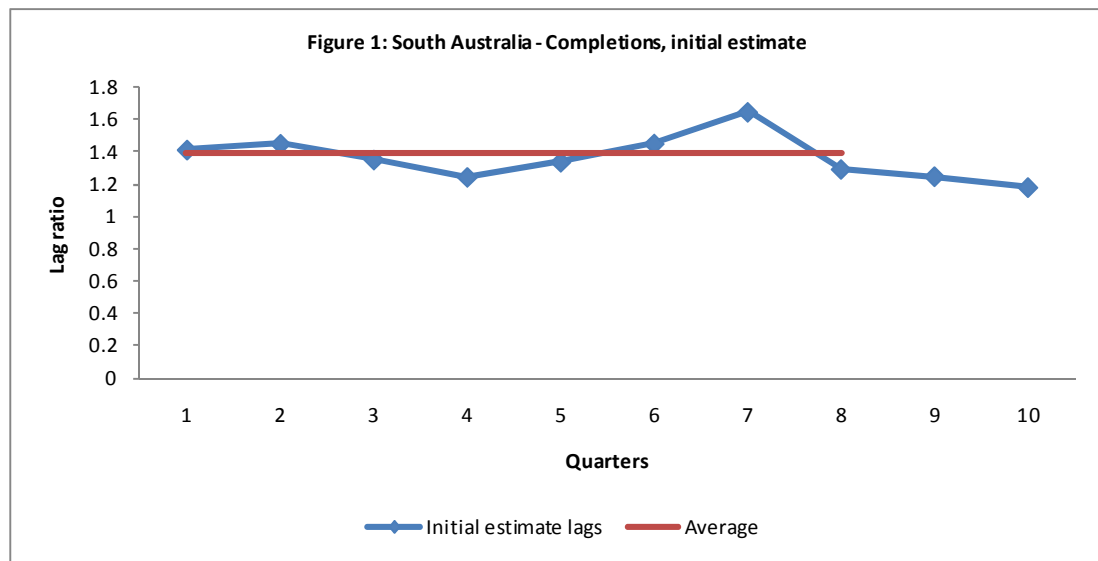
The lags for the first two quarters in the time window are clearly higher than the others (refer to Figure 3 in Attachment 1). Lags for quarters 3 to 8 display a relatively flat line. These lags have been used as the basis for the revision of the estimate.

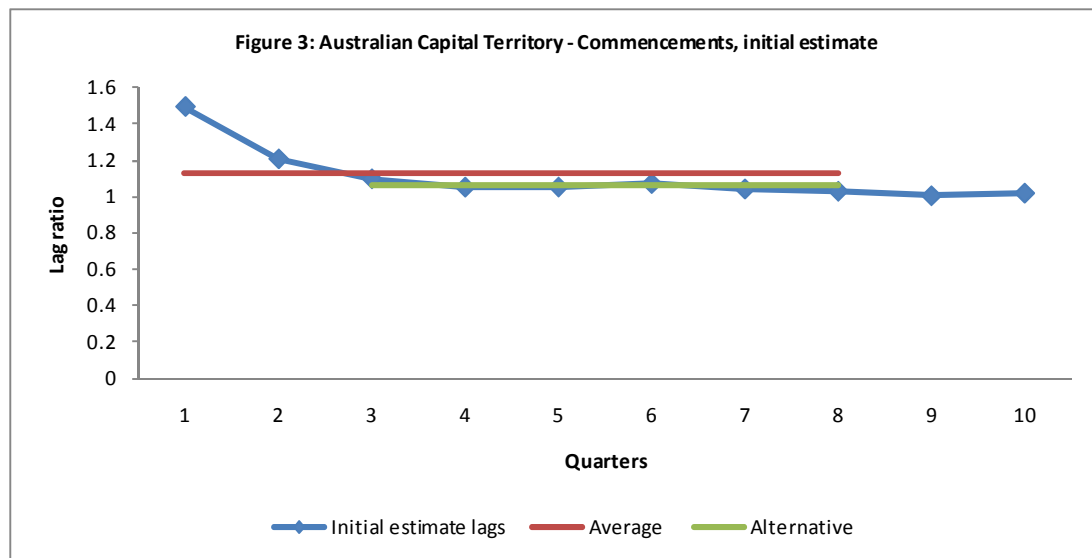
Revised Estimate = 1791

## Attachment 1: Revised Estimates for Collection 64

The following graphs depict the pattern of the lag ratios for the estimates that were revised. The graph shows the lag ratios for the eight quarters in the time window used in the endorsed model (labelled 1 to 8) and also the two quarters following (labelled 9 and 10).

Horizontal lines are also displayed on the graph. One represents the average lag as calculated from the lags in the time window used in the endorsed model (red line). Where there is another, it represents the average lag as calculated from the alternative time period used for the revised estimate (green line).

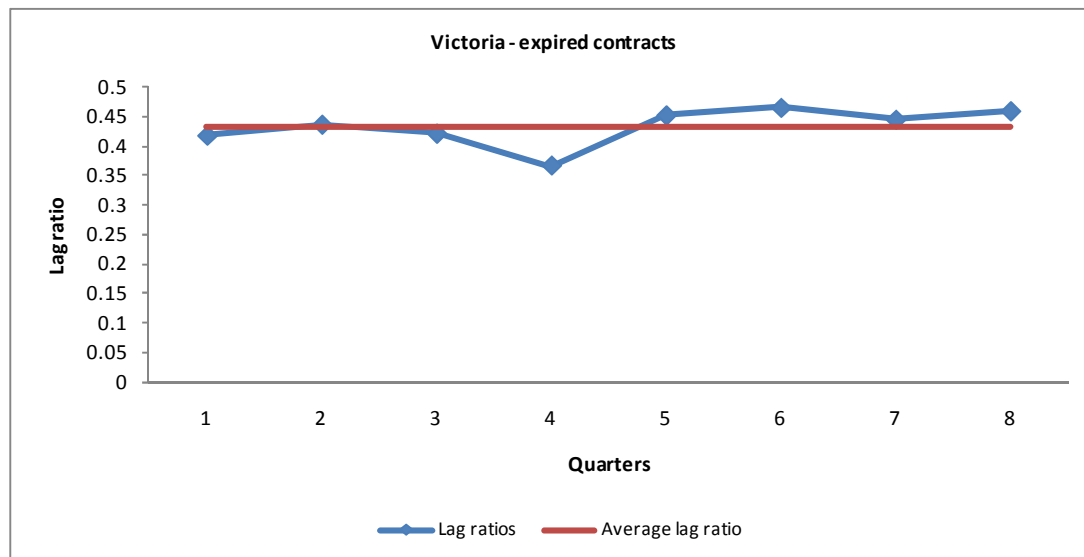
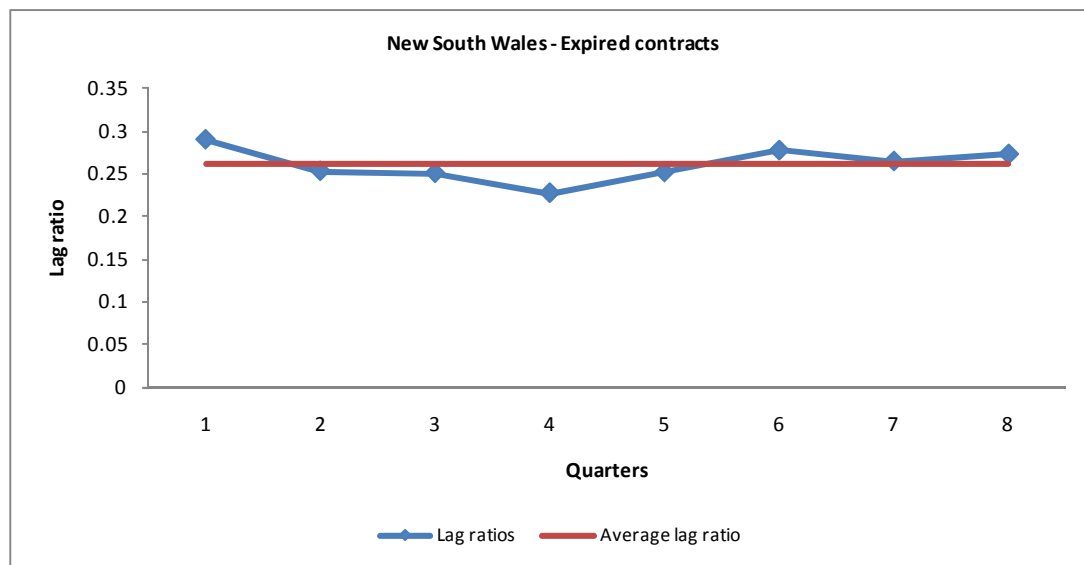




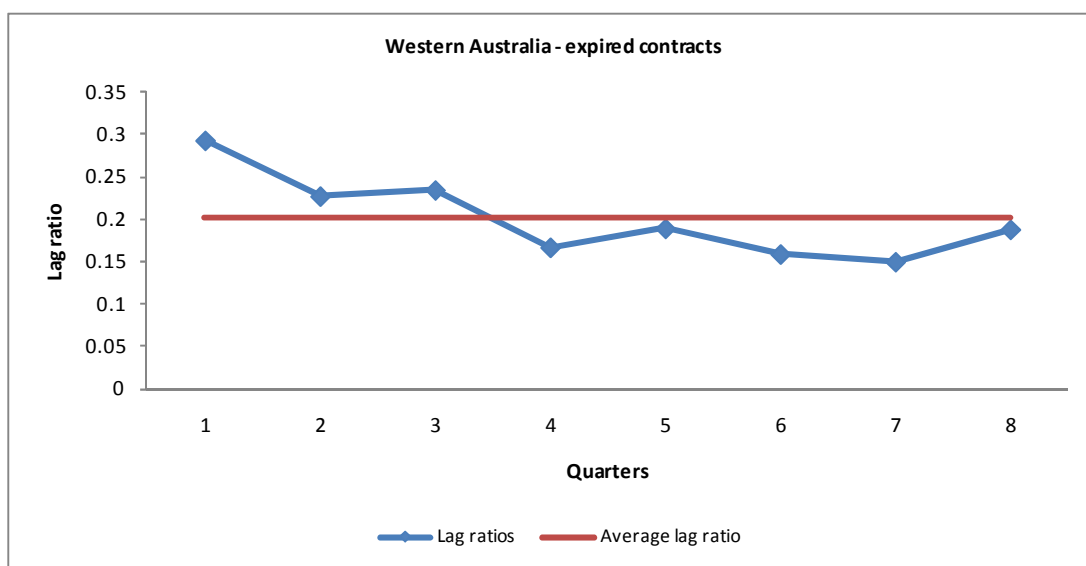
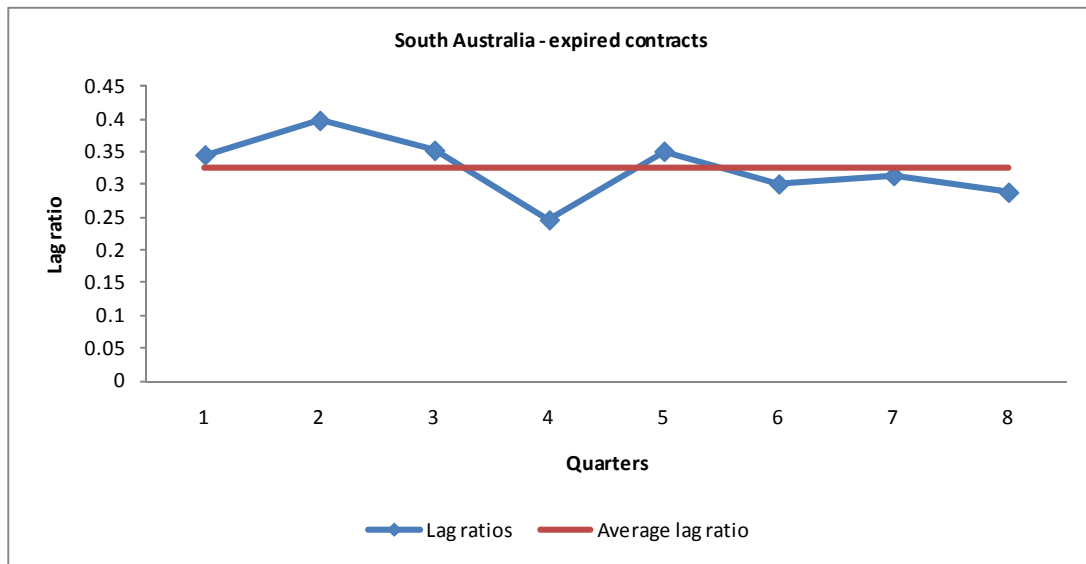
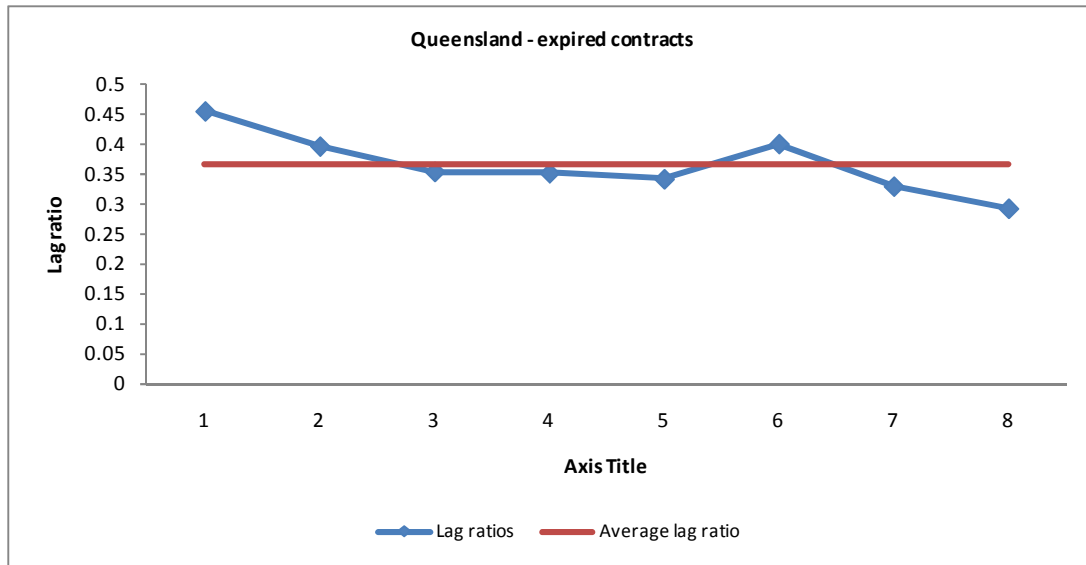
## Attachment 2: Expired Contracts for Collection 64

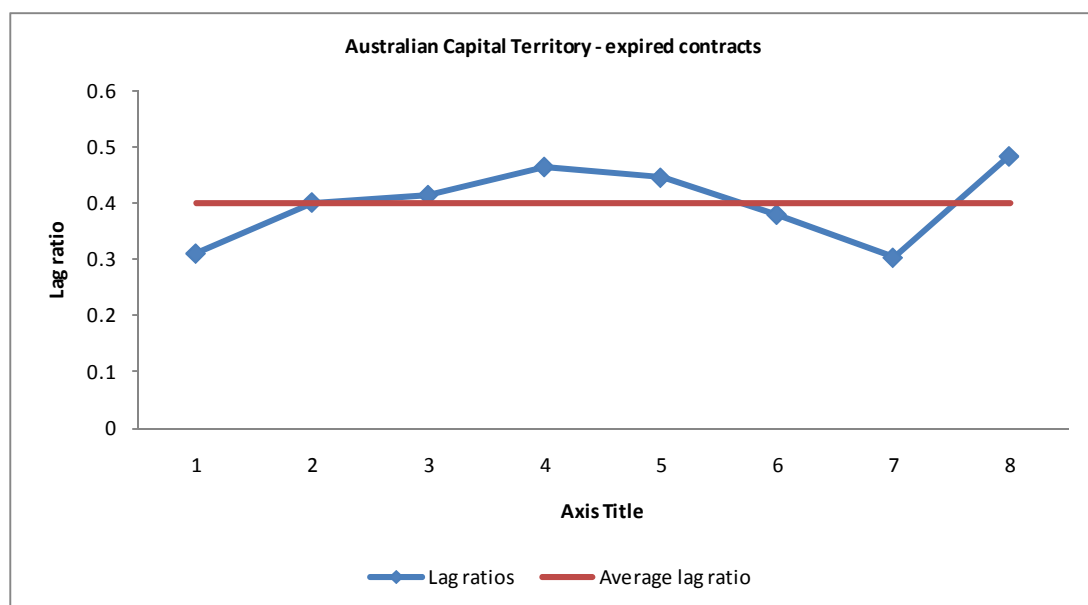
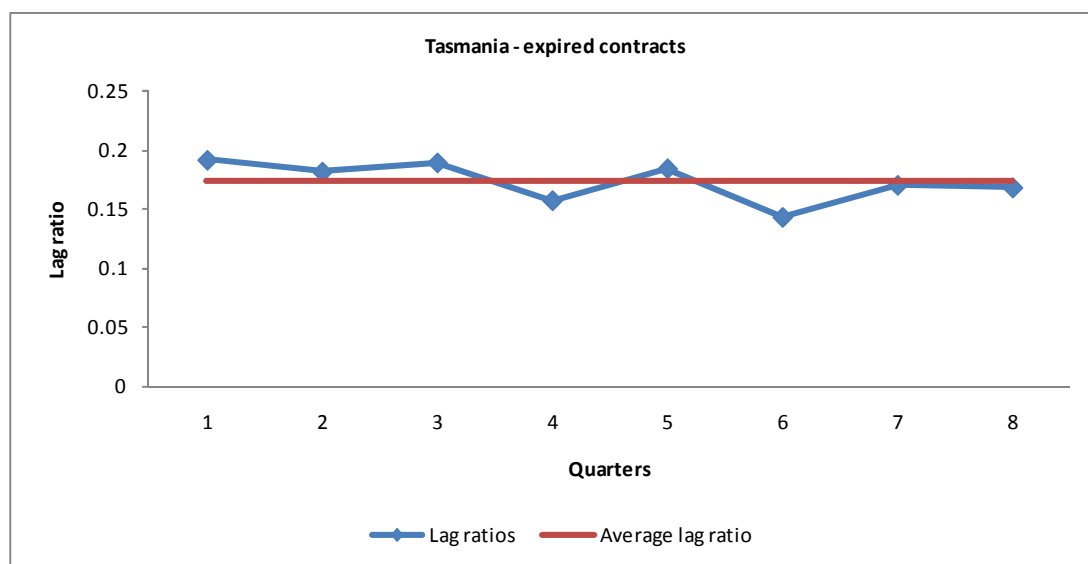
Although subject to high relative errors, estimates of expired contracts have not been altered because they are such a small contributor to the in training estimate. The following graphs depict the pattern of the lag ratios for the estimates of expired contracts. As can be seen from the following graphs, the pattern of the lags does not always suggest an alternative way of estimating expired contracts.

The graphs show the lag ratios for the eight quarters in the time window used in the endorsed model (labelled 1 to 8). A horizontal line is also displayed on each graph, representing the average lag as calculated from the lags in the time window (red line).









# Adjustment note for collection 63

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NCVER examines the quarterly apprentice and trainee estimates produced by the endorsed model in order to check that the estimates are reasonable. In particular, a decision rule was introduced in collection 45 that mandated reviewing all estimates with relative prediction errors of 10% or more. The goal of the review is to correct for any large bias in estimation that might be caused by changes in the pattern of reporting practices over time. Note that whilst an estimate might be adjusted for bias, its associated prediction error is not altered.

Commencement estimates in the Australian Capital Territory for December quarter 2009 and September quarter 2009 were associated with relative prediction errors over 10%. For June quarter 2009, the relative prediction error was around 8% and was also reviewed.

The relative prediction errors for expired contracts remained typically high although much reduced from the levels experienced in past years. In particular, both NSW and Victoria are under 10% and the highest value is about 32%.

The contribution of expired contracts to the in training estimate is usually small both in level and variation. High relative errors appear to be explained to some degree by the fact that the estimates are small numbers and therefore any variation is relatively large. Adjustments to the estimates of expired contracts have little effect on the corresponding estimates of in training. Consequently, no alterations to estimates of expired contracts have been made.

## **Australian Capital Territory**

### Commencements for the June quarter 09

From endorsed model – Estimate = 1160; Relative Error = 8.17%.

Time window for calculating average lag factor is from March 2007 quarter to December 2008 quarter.

The lag for the first quarter in the time window is clearly higher than the others (refer to Figure 1 in Attachment 1). Quarters 2 to 8 show a stable ('flat') trend. Hence, they have been used as the basis for the revision of the estimate.

Revised Estimate = 1129

### Commencements for the September quarter 09

From endorsed model – Estimate = 1291; Relative Error = 14.15%.

Time window for calculating average lag factor is from March 2007 quarter to December 2008 quarter.

The lags for the first two quarters in the time window are clearly higher than the others (refer to Figure 2 in Attachment 1). Quarters 3 to 8 show a flat trend. So they were used as the basis for the revision of the estimate.

Revised Estimate = 1200

### Commencements for the December quarter 09

From endorsed model – Estimate = 959; Relative Error = 15.09%.

Time window for calculating average lag factor is from March 2007 quarter to December 2008 quarter.

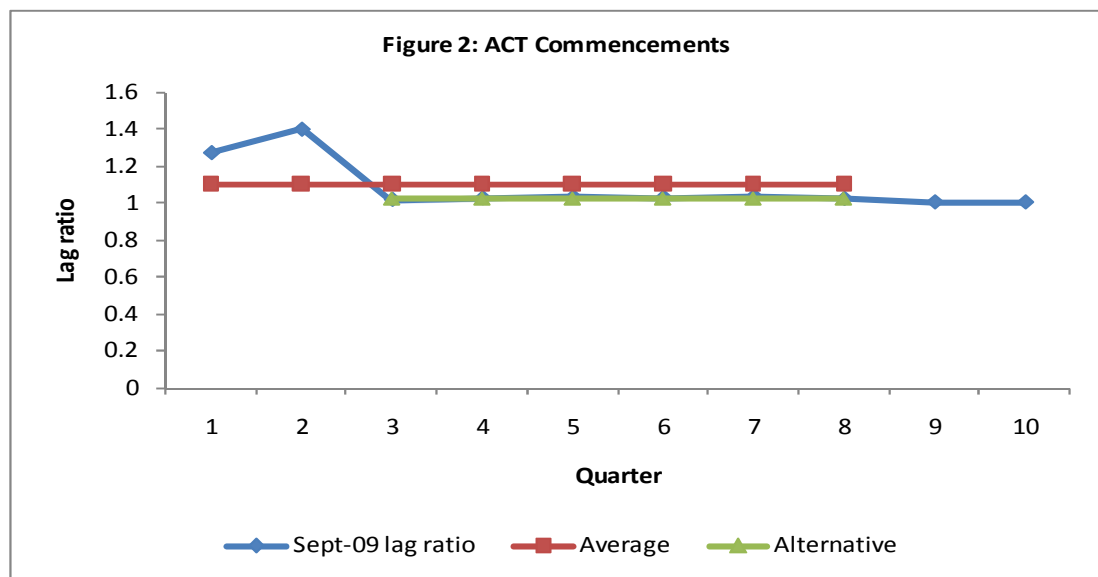
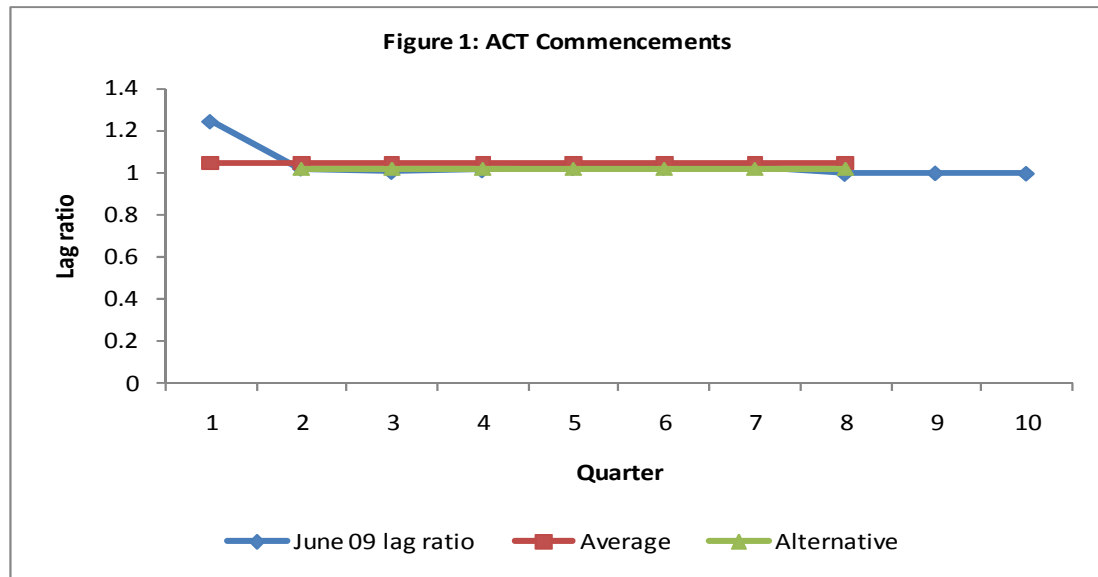
The lags for the first three quarters in the time window are clearly higher than the others (refer to Figure 3 in Attachment 1). Quarters 4 to 8 have been used as the basis for the revision of the estimate because of the flat trend.

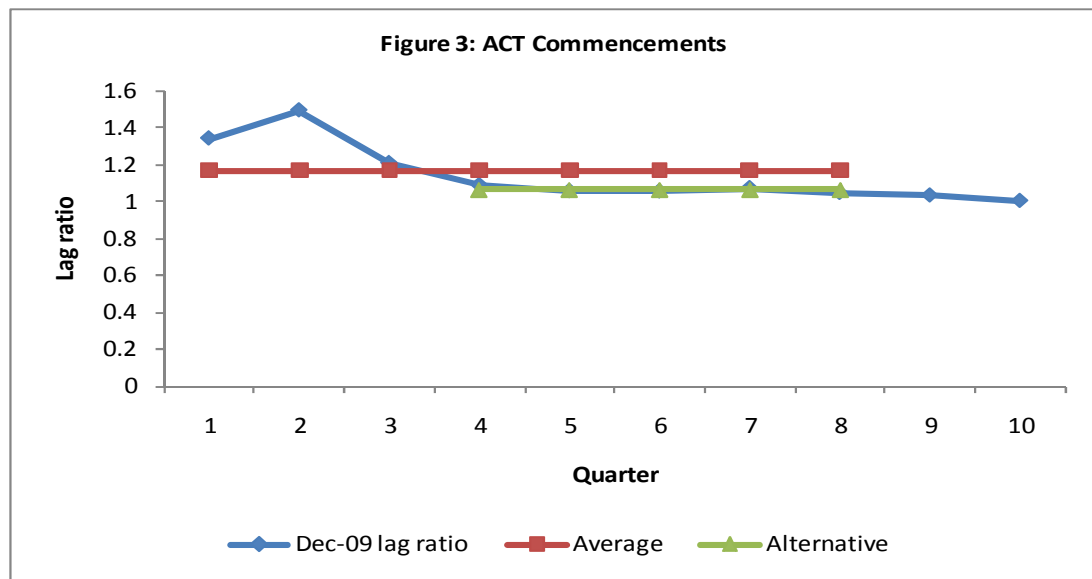
Revised Estimate = 872

## Attachment 1: Revised Estimates for Collection 63

The following graphs depict the pattern of the lag ratios for the estimates that were revised. The graph shows the lag ratios for the eight quarters in the time window used in the endorsed model (labelled 1 to 8) and also the two quarters following (labelled 9 and 10).

Horizontal lines are also displayed on the graph. One represents the average lag as calculated from the lags in the time window used in the endorsed model (red line). Where there is another, it represents the average lag as calculated from the alternative time period used for the revised estimate (green line).

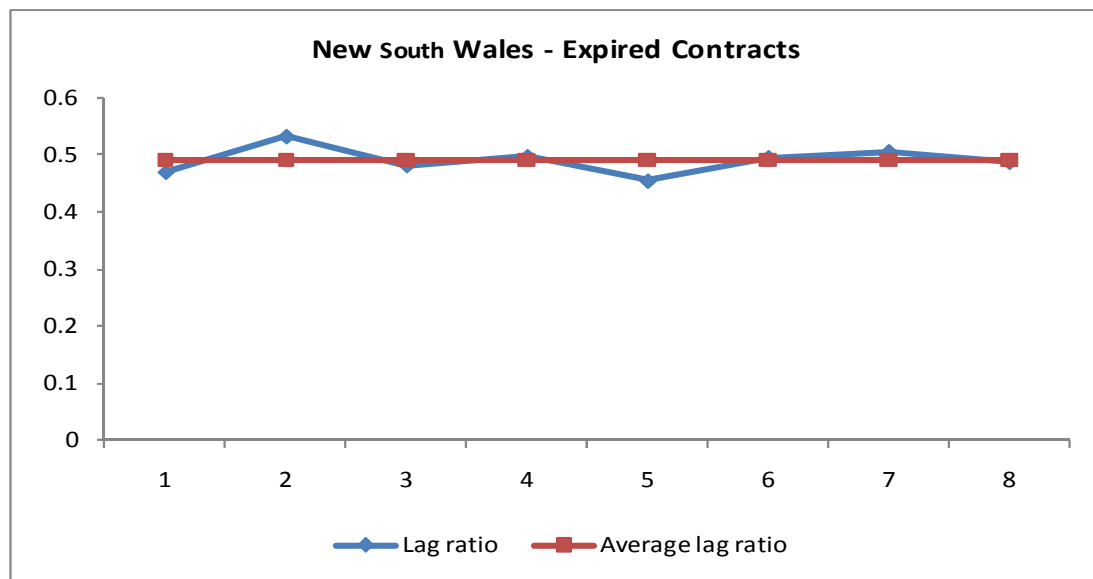


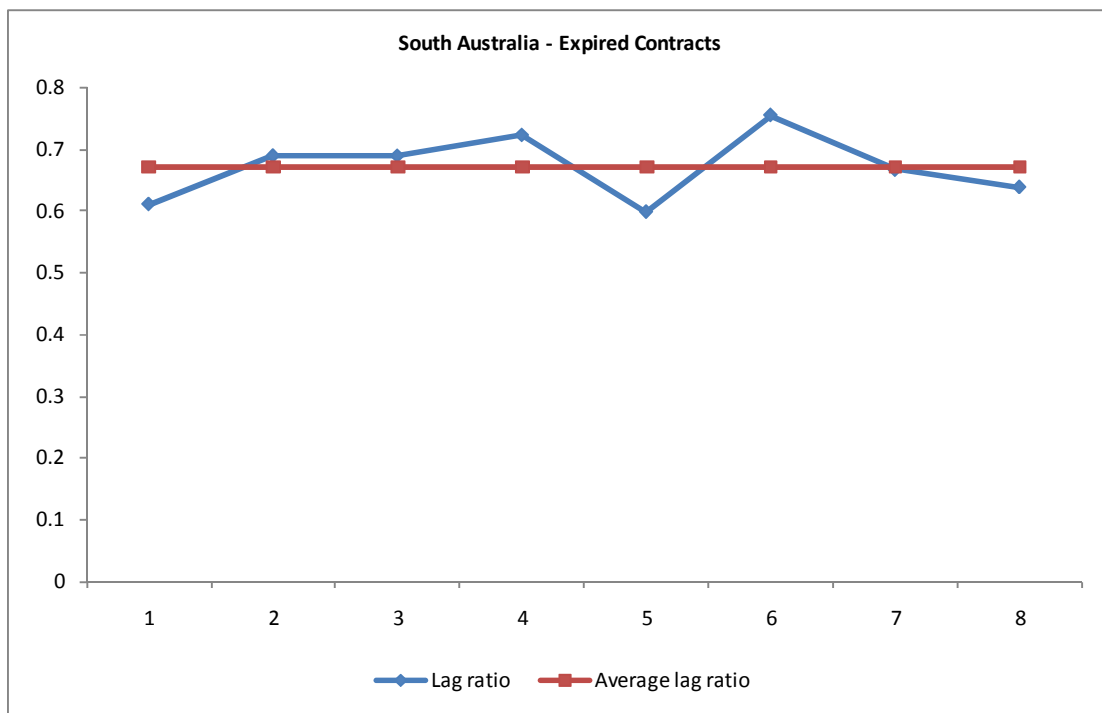
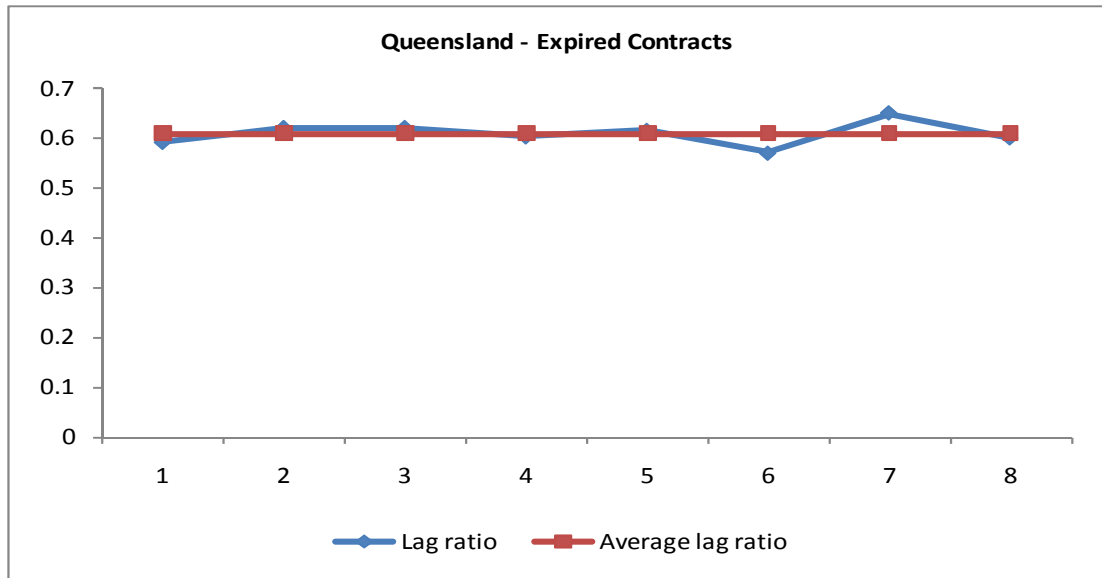


## Attachment 2: Expired Contracts for Collection 63

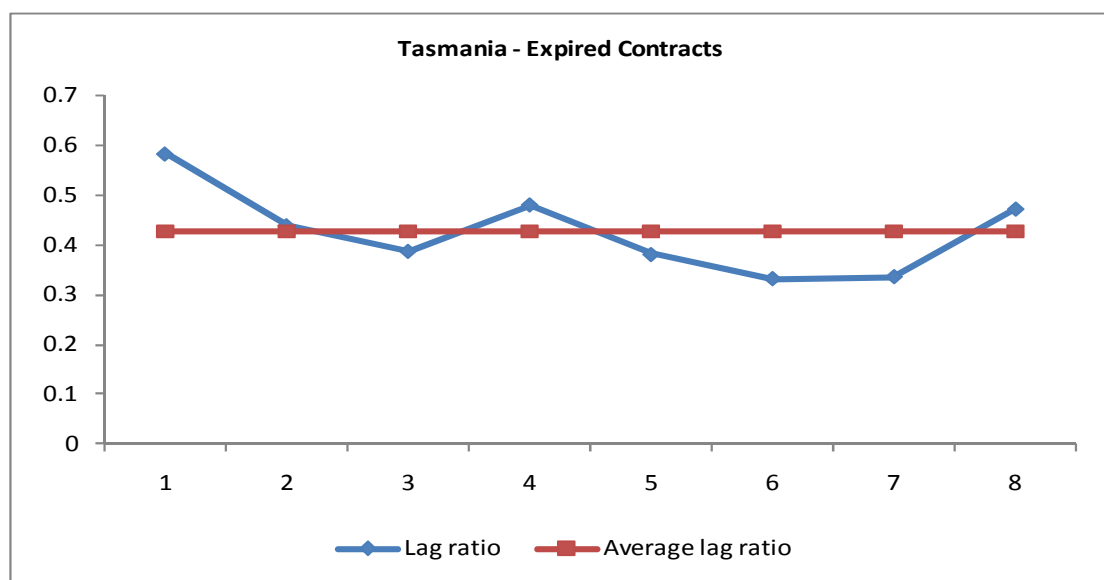
Although subject to high relative errors, estimates of expired contracts have not been altered because they are such a small contributor to the in training estimate. The following graphs depict the pattern of the lag ratios for the estimates of expired contracts. As can be seen from the following graphs, the pattern of the lags does not always suggest an alternative way of estimating expired contracts.

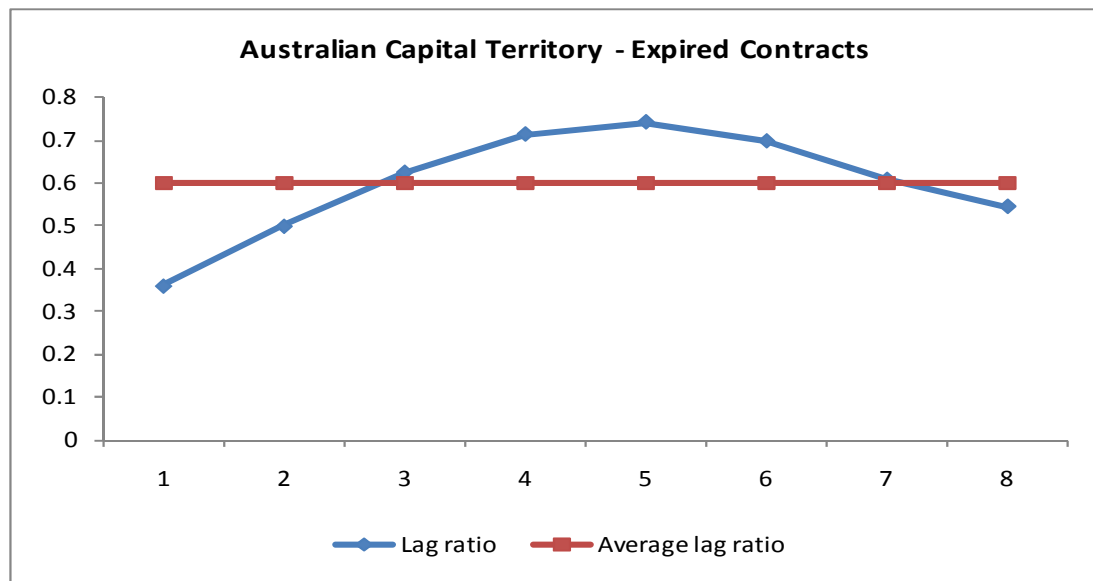
The graphs show the lag ratios for the eight quarters in the time window used in the endorsed model (labelled 1 to 8). A horizontal line is also displayed on each graph, representing the average lag as calculated from the lags in the time window (red line).











# Adjustment note for collection 62

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NCVER examines the quarterly apprentice and trainee estimates produced by the endorsed model in order to check that the estimates are reasonable. In particular, a decision rule was introduced in collection 45 that mandated reviewing all estimates with relative prediction errors of 10% or more. The goal of the review is to correct for any large bias in estimation that might be caused by changes in the pattern of reporting practices over time. Note that whilst an estimate might be adjusted for bias, its associated prediction error is not altered.

Commencement estimates in the Australian Capital Territory for September quarter 2009 and June quarter 2009 were associated with relative prediction errors over 10%. For March quarter 2009, the relative prediction error was nearly 8% and was also reviewed.

The relative prediction errors for expired contracts remained typically high although much reduced from the levels experienced in past years. In particular, both NSW and Victoria are under 10% and the highest value is about 35%.

The contribution of expired contracts to the in training estimate is usually small both in level and variation. High relative errors appear to be explained to some degree by the fact that the estimates are small numbers and therefore any variation is relatively large. Adjustments to estimates of expired contracts have little effect on the corresponding estimates of in training. Consequently, no alterations to estimates of expired contracts have been made.

## **Australian Capital Territory**

### Commencements for the March quarter 09

From endorsed model – Estimate = 1889; Relative Error = 7.86%.

Time window for calculating average lag factor is from December 2006 quarter to September 2008 quarter.

The lag for the second quarter in the time window is clearly higher than the others. The following two quarters after the time window indicate a decreasing trend (refer to Figure 1 in Attachment 1). Quarters 3 to 8 show a stable ('flat') trend. Hence, they have been used as the basis for the revision of the estimate.

Revised Estimate = 1828

### Commencements for the June quarter 09

From endorsed model – Estimate = 1229; Relative Error = 13.71%.

Time window for calculating average lag factor is from December 2006 quarter to September 2008 quarter.

The lags for the second and third quarters in the time window are clearly higher than the others. The following two quarters after the time window also indicate a decreasing trend (refer to Figure 2 in Attachment 1). Similar to March 09 quarter, Quarters 4 to 8 show a flat trend. So they were used as the basis for the revision of the estimate.

Revised Estimate = 1136

### Commencements for the September quarter 09

From endorsed model – Estimate = 1368; Relative Error = 14.35%.

Time window for calculating average lag factor is from December 2006 quarter to September 2008 quarter.

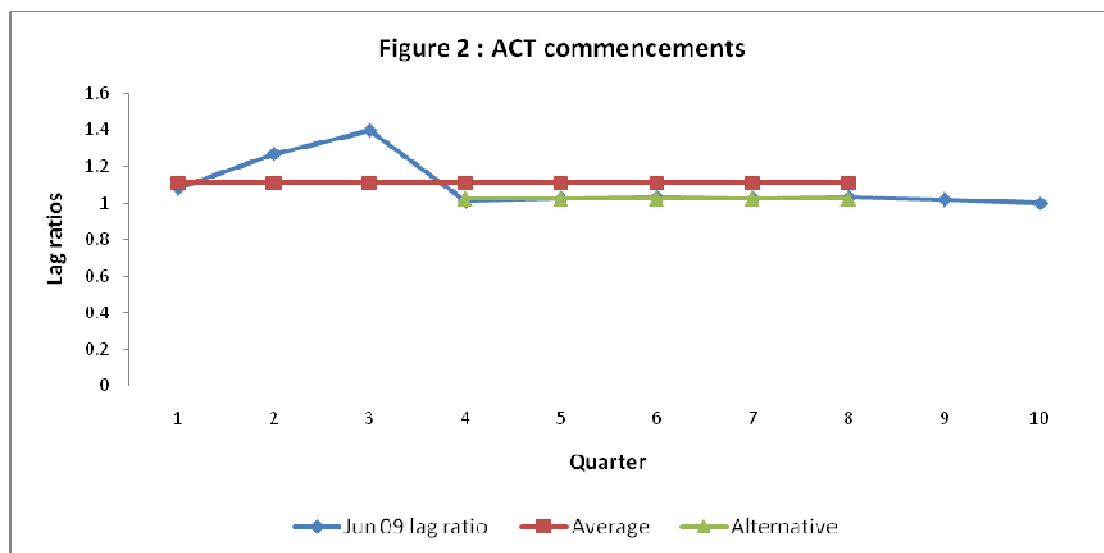
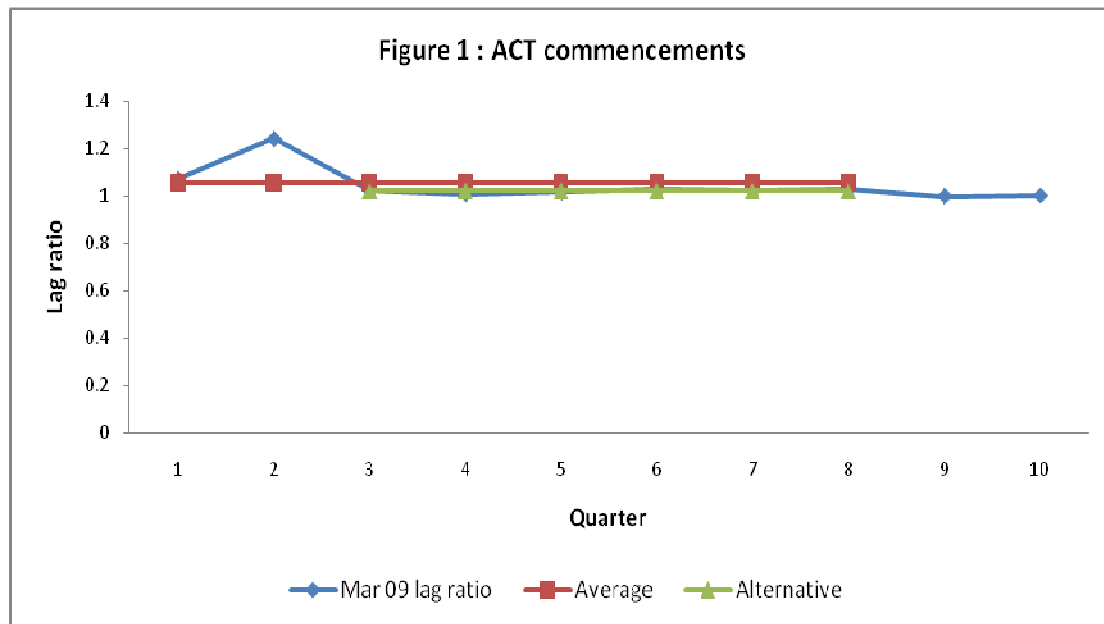
The lags for the second and third quarters in the time window are clearly higher than the others. The following two quarters after the time window indicate a return to the lower level (refer to Figure 2 in Attachment 1). Quarters 5 to 8 have been used as the basis for the revision of the estimate because of the flat trend.

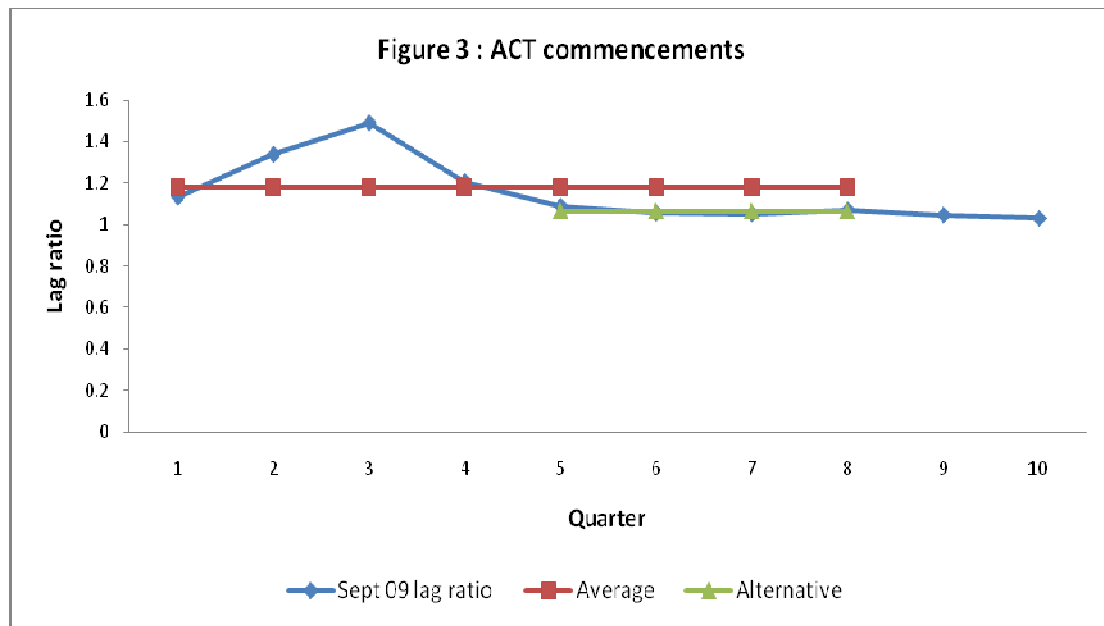
Revised Estimate = 1237

## Attachment 1: Revised Estimates for Collection 62

The following graphs depict the pattern of the lag ratios for the estimates that were revised. The graph shows the lag ratios for the eight quarters in the time window used in the endorsed model (labelled 1 to 8) and also the two quarters following (labelled 9 and 10).

Horizontal lines are also displayed on the graph. One represents the average lag as calculated from the lags in the time window (red line). Where there is another, it represents the average lag as calculated from the alternative time period used for the revised estimate (green line).

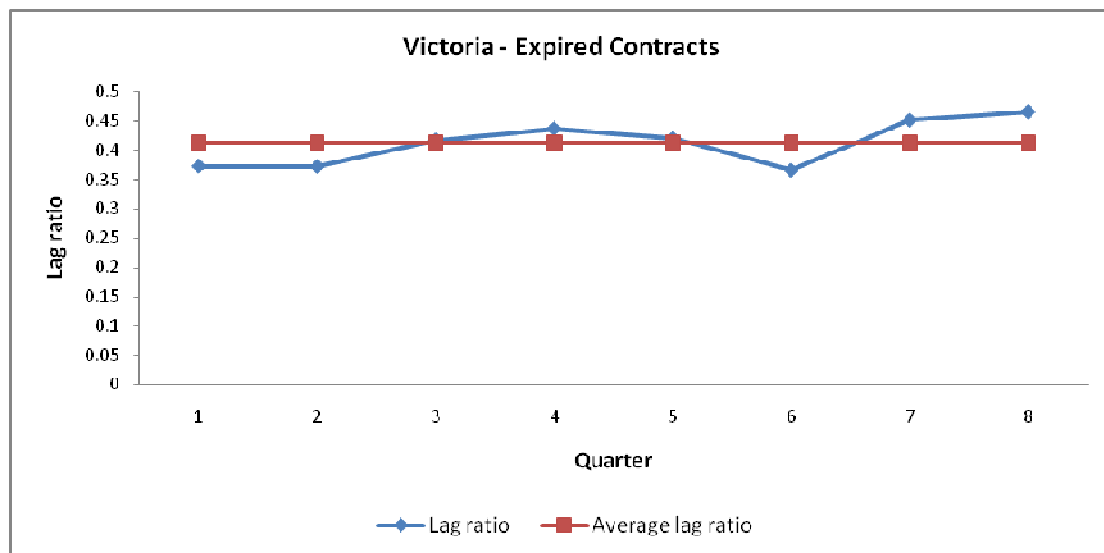
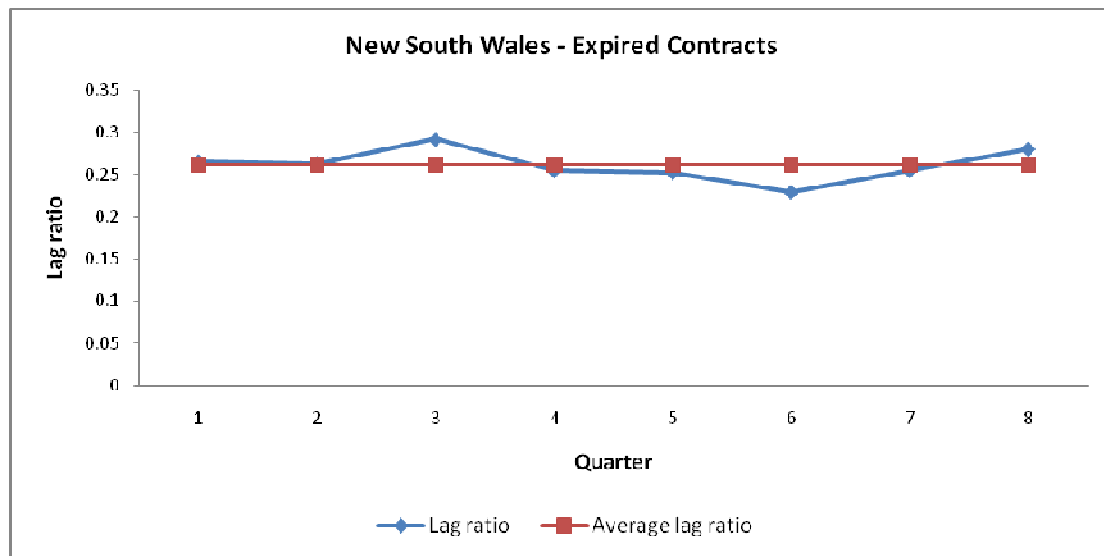


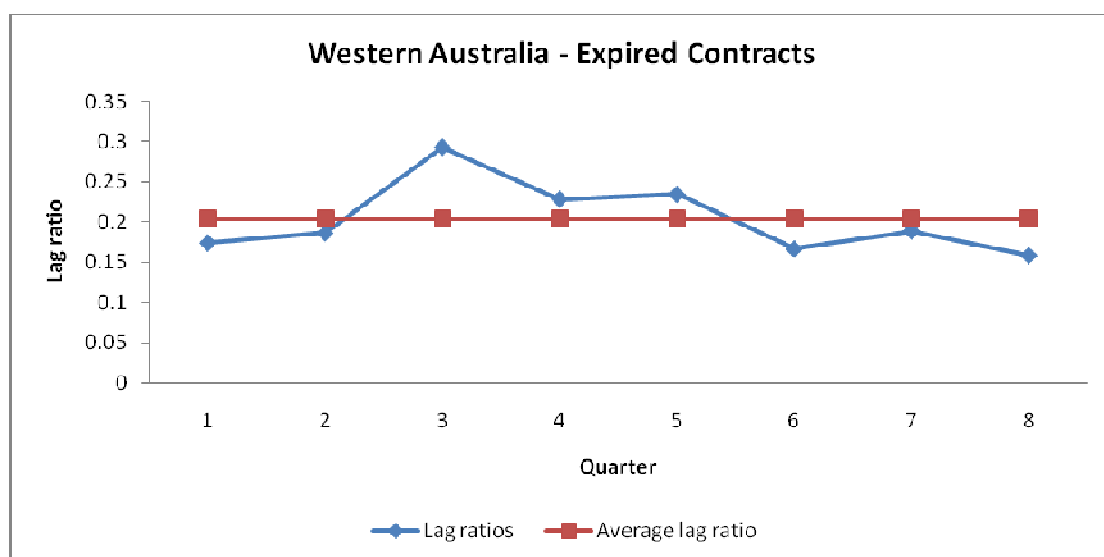
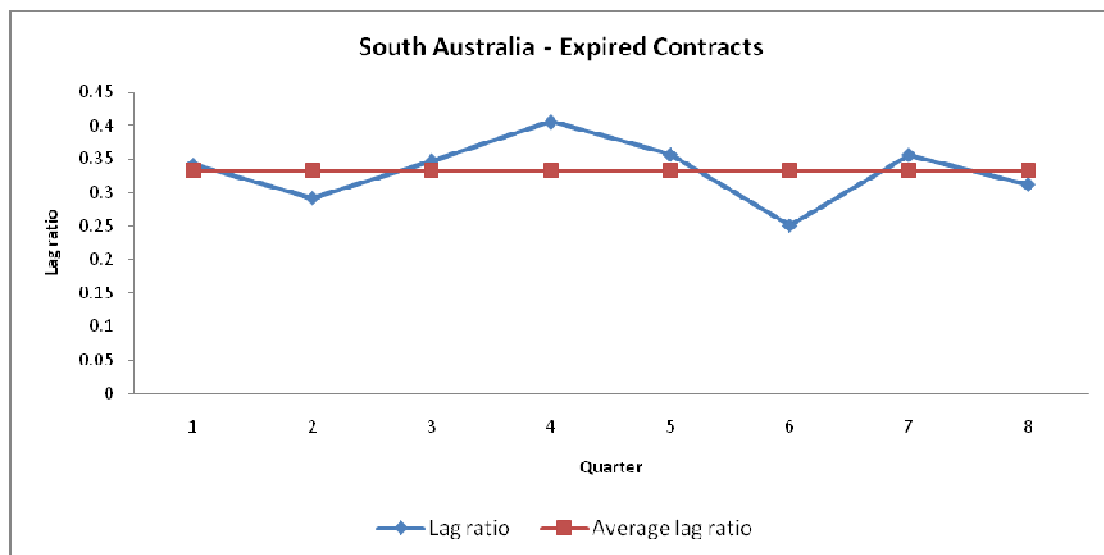
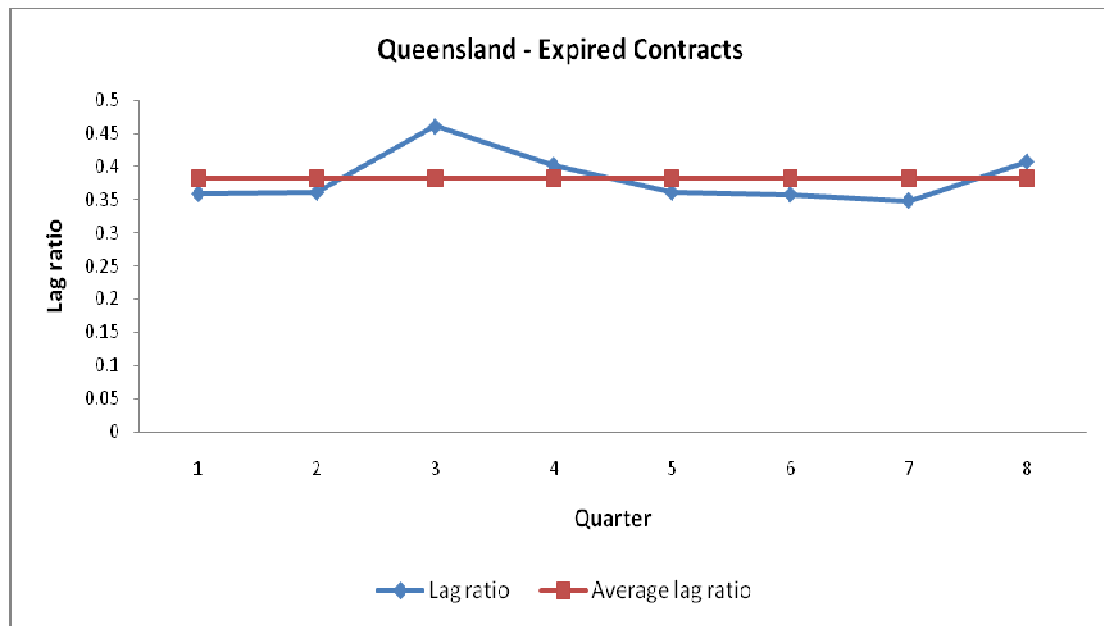


## Attachment 2: Expired Contracts for Collection 62

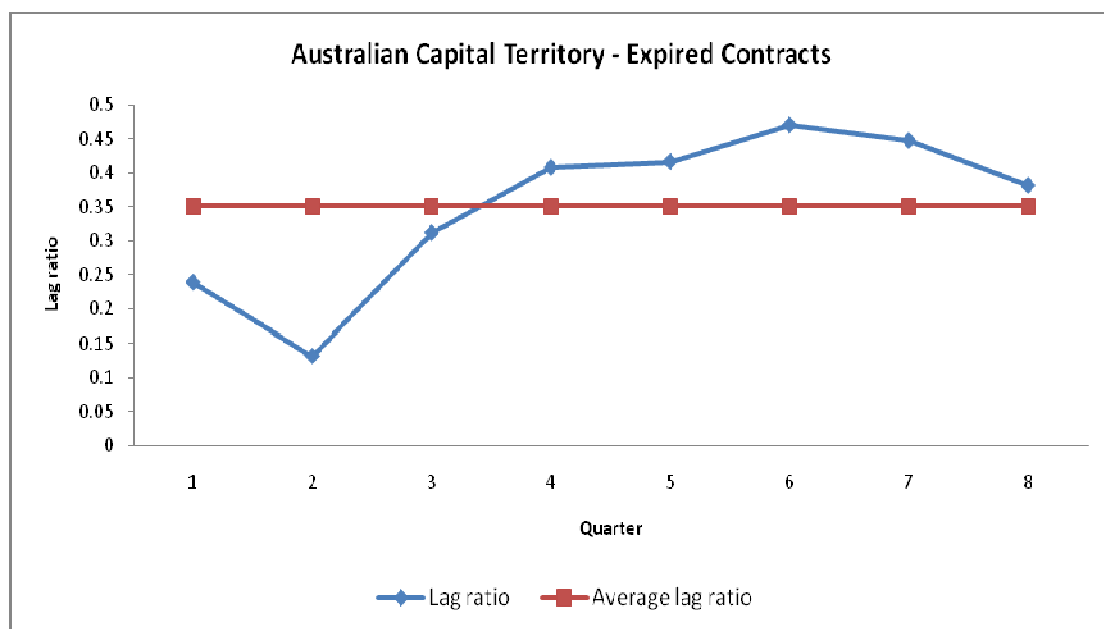
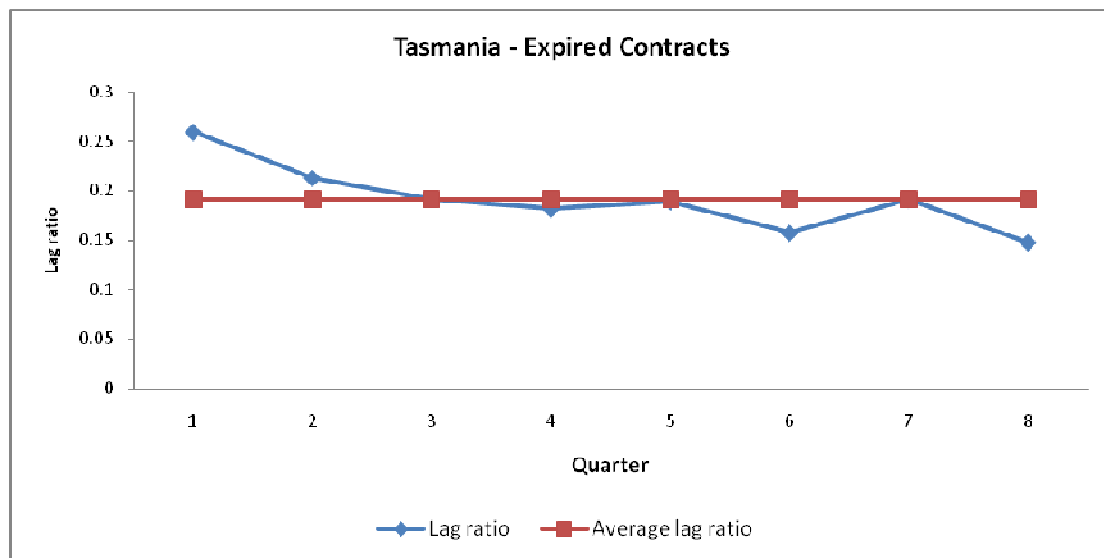
Although subject to high relative errors, estimates of expired contracts have not been altered because they are such a small contributor to the in training estimate. The following graphs depict the pattern of the lag ratios for the estimates of expired contracts. As can be seen from the following graphs, the pattern of the lags does not always suggest an alternative way of estimating expired contracts.

The graphs show the lag ratios for the eight quarters in the time window used in the endorsed model (labelled 1 to 8). A horizontal line is also displayed on each graph, representing the average lag as calculated from the lags in the time window (red line).









# Adjustment note for collection 61

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NCVER examines the quarterly apprentice and trainee estimates produced by the endorsed model in order to check that the estimates are reasonable. In particular, a decision rule was introduced in collection 45 that mandated reviewing all estimates with relative prediction errors of 10% or more. The goal of the review is to correct for any large bias in estimation that might be caused by changes in the pattern of reporting practices over time. Note that whilst an estimate might be adjusted for bias, its associated prediction error is not altered.

Commencement estimates in the Australian Capital Territory for March quarter 2009 and June quarter 2009 were associated with relative prediction errors over 10%. For December quarter 2008, the relative prediction error was over 7% and was also reviewed. In South Australia, the relative prediction error associated with cancellations/withdrawals in June quarter 2009 was over 7% and was also reviewed. However, there was no necessary adjustment made to its estimate.

The relative prediction errors for expired contracts remained typically high. A particularly high relative error for estimates of expired contracts was observed in ACT. As can be seen from Attachment 2, the lag ratios for expired contracts in ACT continue to display an increasing trend within the time window used for estimation. The two quarters following the time window indicate the possibility that this trend might be reversing.

The contribution of expired contracts to the in training estimate is usually small both in level and variation. High relative errors appear to be explained to some degree by the fact that the estimates are small numbers and therefore any variation is relatively large. Adjustments to estimates of expired contracts have little effect on the corresponding estimates of in training. Consequently, no alterations to estimates of expired contracts have been made.

## **Australian Capital Territory**

### Commencements for the December quarter 08

From endorsed model – Estimate = 870; Relative Error = 7.93%.

Time window for calculating average lag factor is from September 2006 quarter to June 2008 quarter.

The lag for the third quarter in the time window is clearly higher than the others. The following two quarters after the time window indicate a decreasing trend (refer to Figure 1 in Attachment 1). Quarters 1 to 2 and 4 to 8 have been used as the basis for the revision of the estimate.

Revised Estimate = 847

### Commencements for the March quarter 08

From endorsed model – Estimate = 1986; Relative Error = 13.77%.

Time window for calculating average lag factor is from September 2006 quarter to June 2008 quarter.

The lags for the third and fourth quarters in the time window are clearly higher than the others. The following two quarters after the time window indicate a return to the lower level (refer to Figure 2 in Attachment 1). Quarters 1 to 2 and 5 to 8 have been used as the basis for the revision of the estimate.

Revised Estimate = 1855

### Commencements for the June quarter 09

From endorsed model – Estimate = 1305; Relative Error = 14.54%.

Time window for calculating average lag factor is from September 2006 quarter to June 2008 quarter.

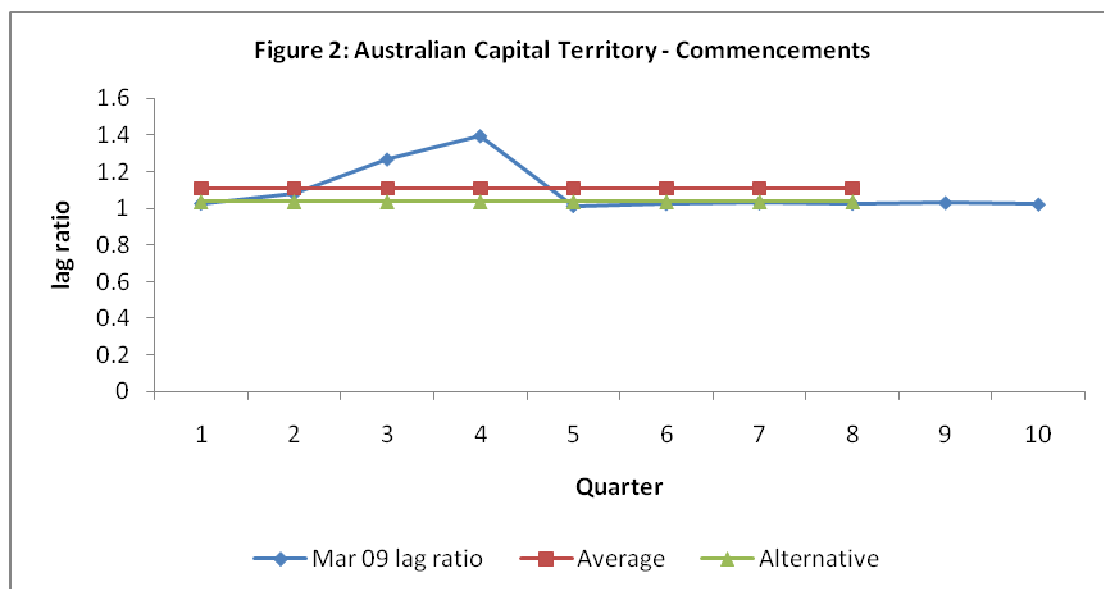
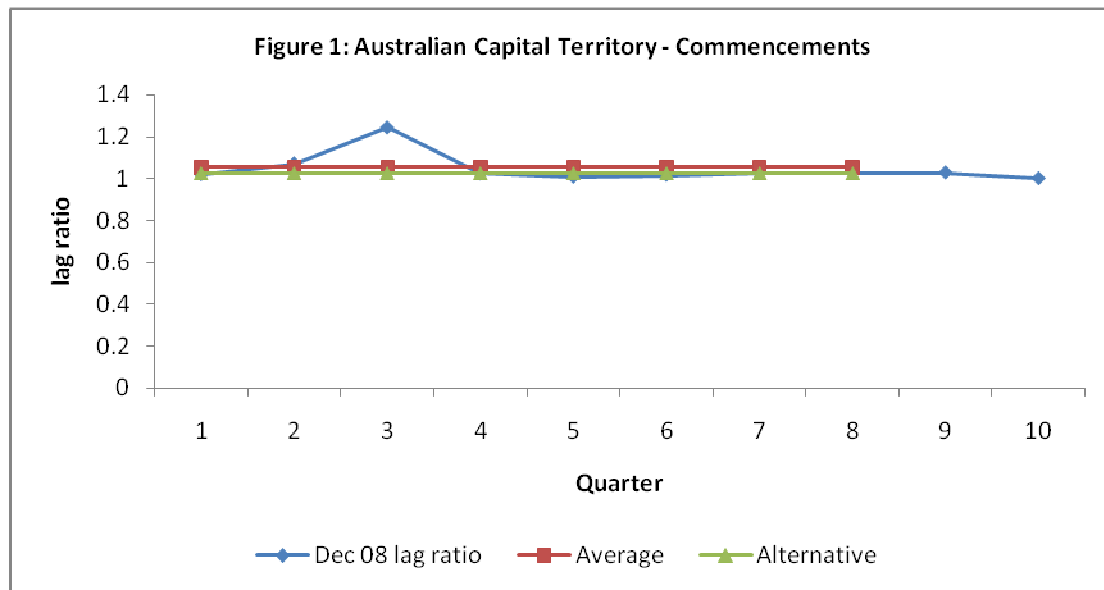
The lags for the third and fourth quarters in the time window are clearly higher than the others. The following two quarters after the time window indicate a return to the lower level (refer to Figure 2 in Attachment 1). Quarters 1 to 2 and 5 to 8 have been used as the basis for the revision of the estimate.

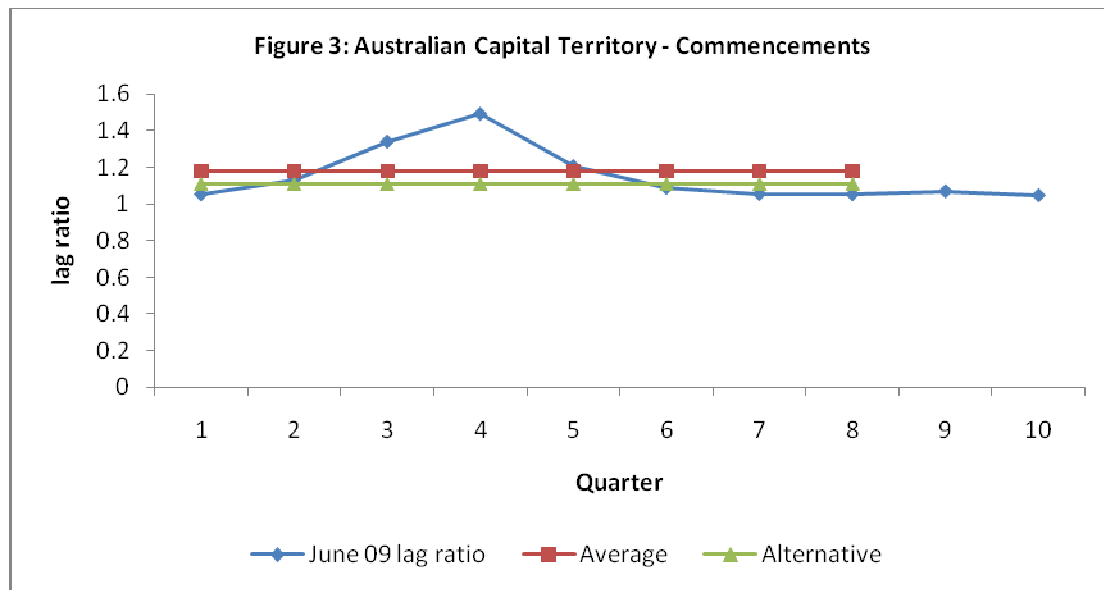
Revised Estimate = 1226

## Attachment 1: Revised Estimates for Collection 61

The following graphs depict the pattern of the lag ratios for the estimates that were revised. The graph shows the lag ratios for the eight quarters in the time window used in the endorsed model (labelled 1 to 8) and also the two quarters following (labelled 9 and 10).

Horizontal lines are also displayed on the graph. One represents the average lag as calculated from the lags in the time window (red line). Where there is another, it represents the average lag as calculated from the alternative time period used for the revised estimate (green line).

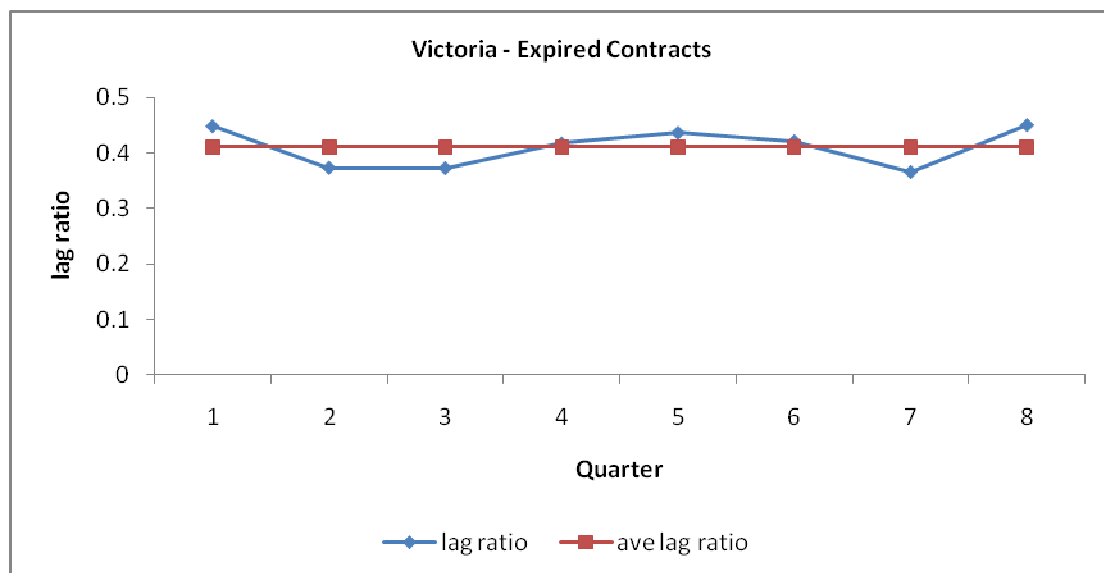
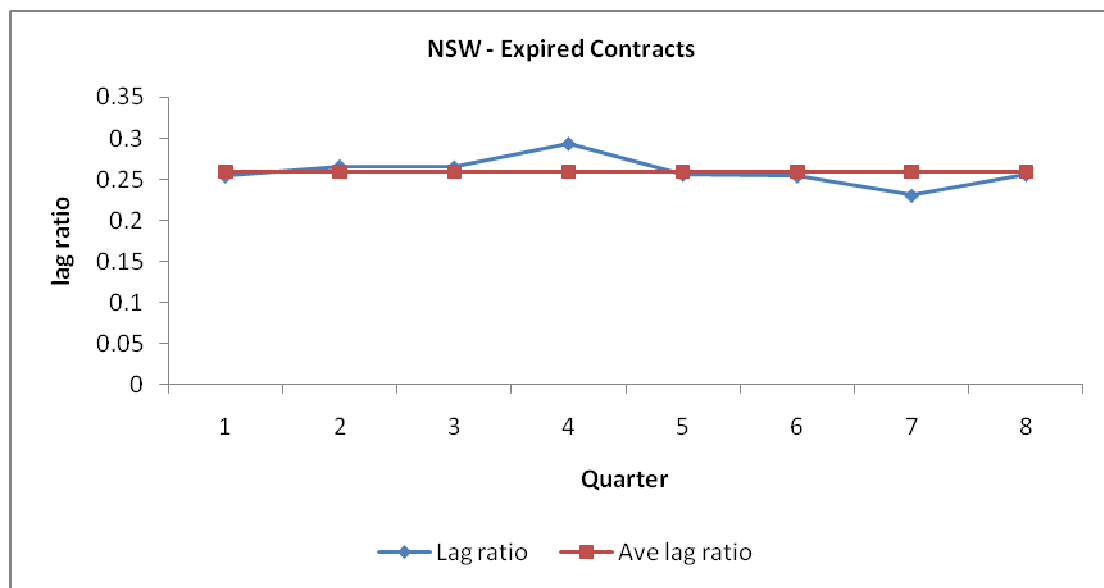


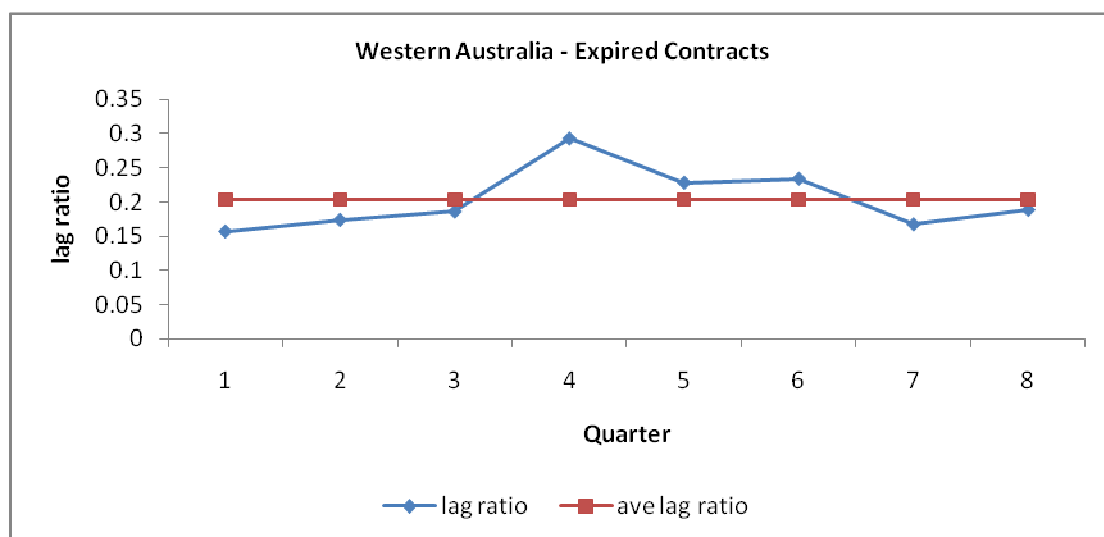
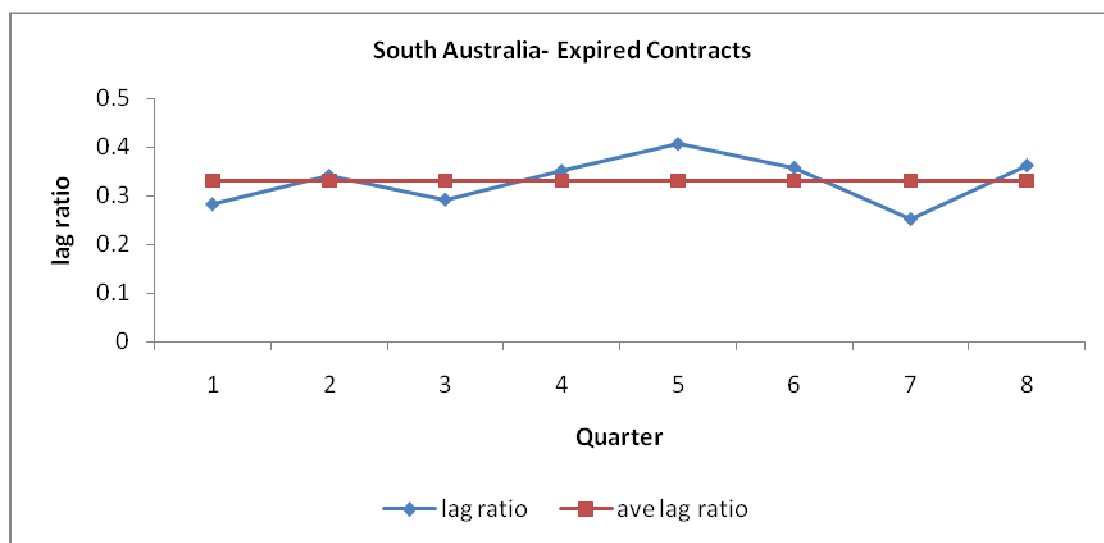
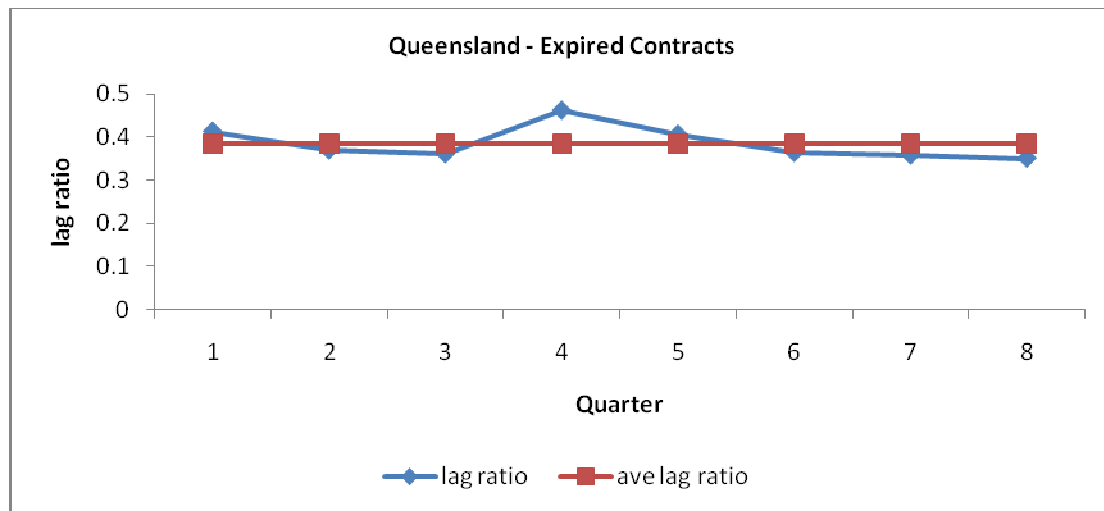


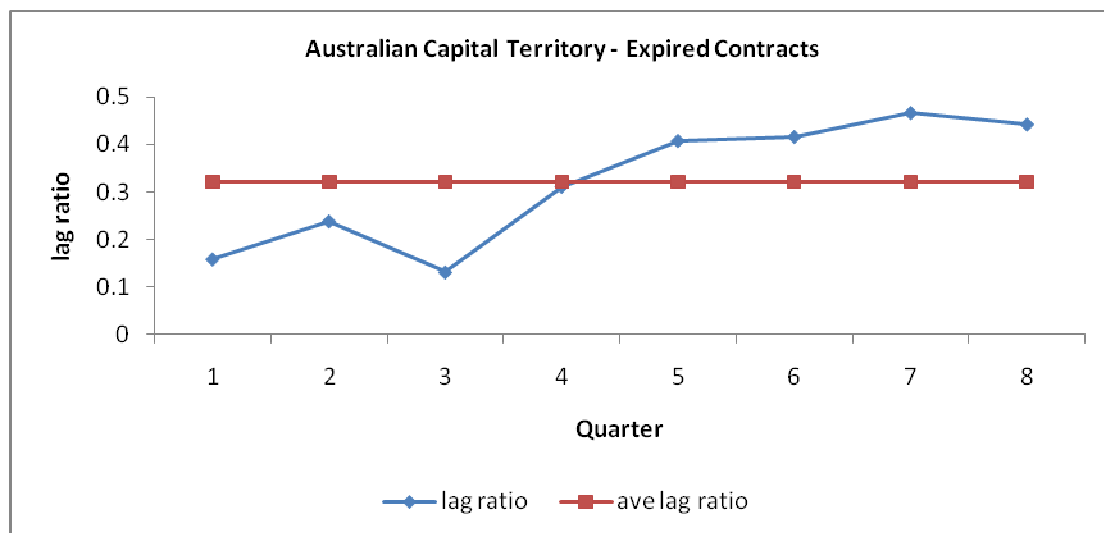
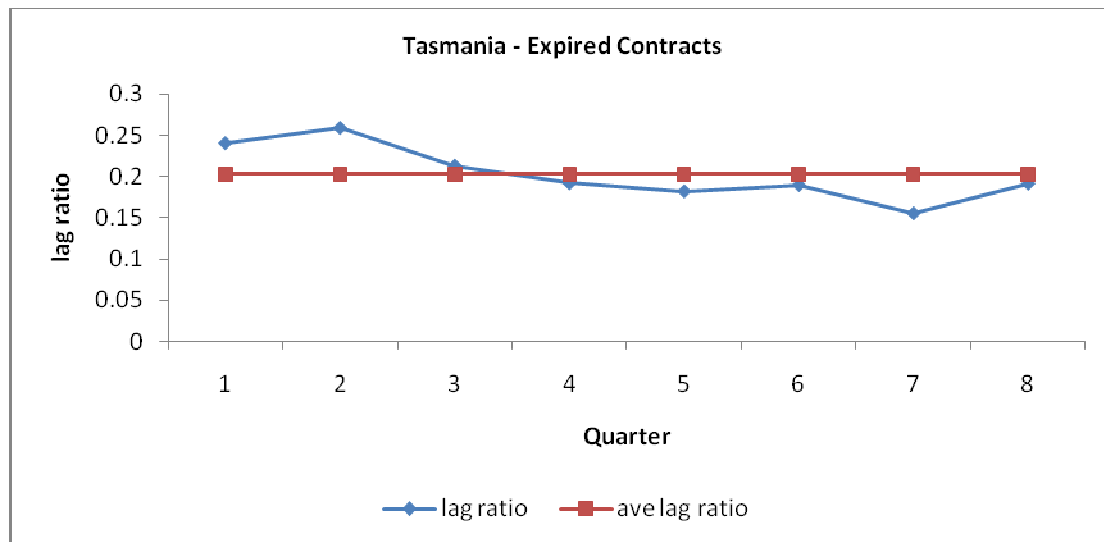
## Attachment 2: Expired Contracts for Collection 61

Although subject to high relative errors, estimates of expired contracts have not been altered because they are such a small contributor to the in training estimate. The following graphs depict the pattern of the lag ratios for the estimates of expired contracts. As can be seen from the following graphs, the pattern of the lags does not always suggest an alternative way of estimating expired contracts.

The graphs show the lag ratios for the eight quarters in the time window used in the endorsed model (labelled 1 to 8). A horizontal line is also displayed on each graph, representing the average lag as calculated from the lags in the time window (red line).









# Adjustment note for Collection 60

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NCVER examines the quarterly apprentice and trainee estimates produced by the endorsed model in order to check that the estimates are reasonable. In particular, a decision rule was introduced in collection 45 that mandated reviewing all estimates with relative prediction errors of 10% or more. The goal of the review is to correct for any large bias in estimation that might be caused by changes in the pattern of reporting practices over time. Note that whilst an estimate might be adjusted for bias, its associated prediction error is not altered.

Commencement estimates in the Australian Capital Territory for December quarter 2008 and March quarter 2009 were associated with relative prediction errors over 10%. In South Australia, the relative prediction error associated with cancellations/withdrawals in March quarter 2009 was over 7% and was also reviewed.

The relative prediction errors for expired contracts remained typically high although they were generally lower than those calculated for the previous collection. A particularly high relative error for estimates of expired contracts was observed in ACT. As can be seen from Attachment 2, the lag ratios for expired contracts in ACT continue to display an increasing trend within the time window used for estimation. The two quarters following the time window indicate the possibility that this trend might be reversing.

The contribution of expired contracts to the in training estimate is usually small both in level and variation. High relative errors appear to be explained to some degree by the fact that the estimates are small numbers and therefore any variation is relatively large. Adjustments to estimates of expired contracts have little effect on the corresponding estimates of in training. Consequently, no alterations to estimates of expired contracts have been made.

## **Australian Capital Territory**

### Commencements for the December quarter 08

From endorsed model – Estimate = 874; Relative Error = 12.84%.

Time window for calculating average lag factor is from June 2006 quarter to March 2008 quarter.

The lags for the fourth and fifth quarters in the time window are clearly higher than the others. The following two quarters after the time window indicate a return to the lower level (refer to Figure 1 in Attachment 1). Quarters 1 to 3 and 6 to 8 have been used as the basis for the revision of the estimate.

Revised Estimate = 822

### Commencements for the March quarter 09

From endorsed model – Estimate = 2007; Relative Error = 13.68%.

Time window for calculating average lag factor is from June 2006 quarter to March 2008 quarter.

The lags for the fourth, fifth and sixth quarters in the time window are clearly higher than the others. The following two quarters after the time window indicate a return to the lower level (refer to Figure 2 in Attachment 1). Quarters 1 to 3 and 7 to 8 have been used as the basis for the revision of the estimate.

Revised Estimate = 1848

## **South Australia**

### Cancellations/withdrawals for the March quarter 09

From endorsed model – Estimate = 1,601; Relative Error = 7.25%.

Time window for calculating average lag factor is from June 2005 quarter to March 2007 quarter.

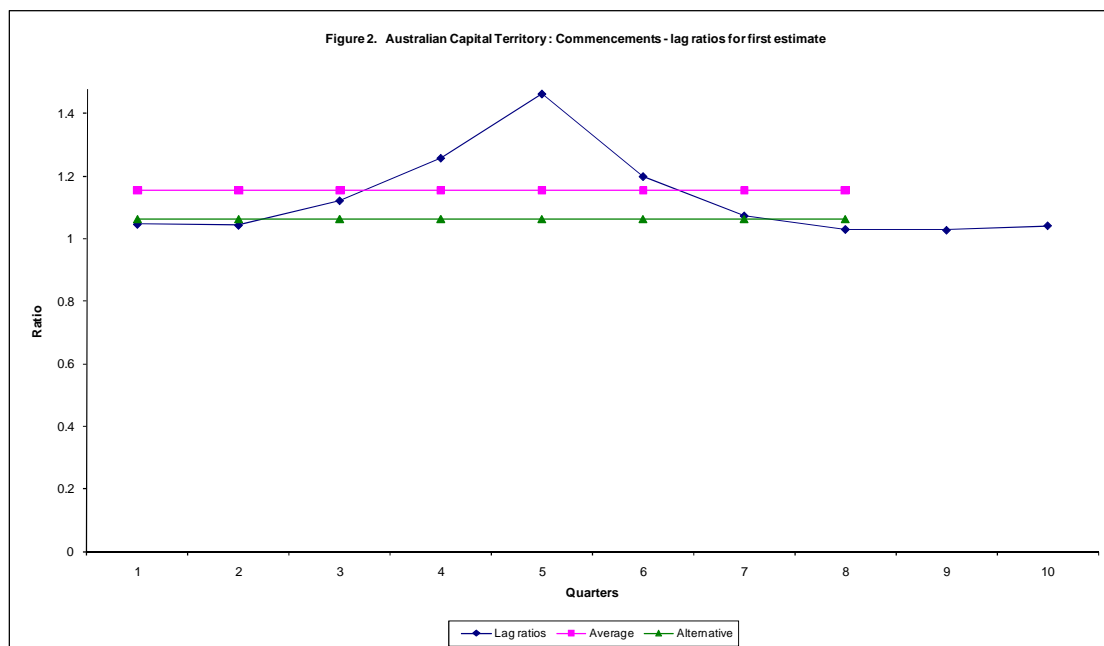
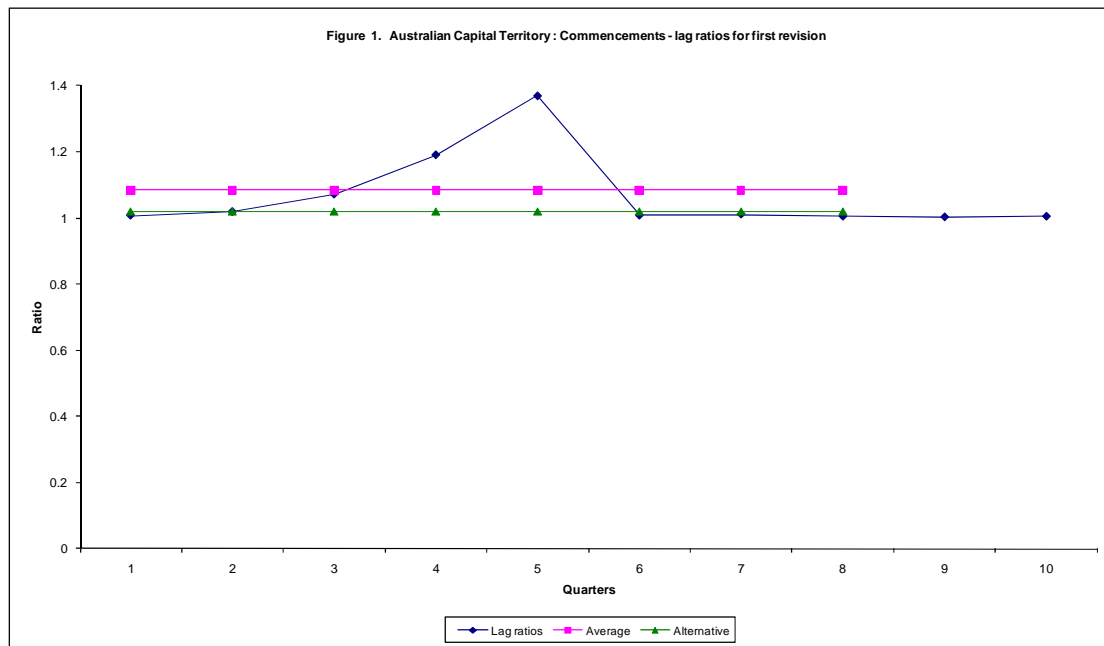
The lags for quarters 1 to 4 are clearly below the lags for quarters 5 to 8. The two quarters following the time window indicate that the higher level will continue (refer to Figure 3 in Attachment 1). Quarters 5 to 8 have been used as the basis for the revision of the estimate.

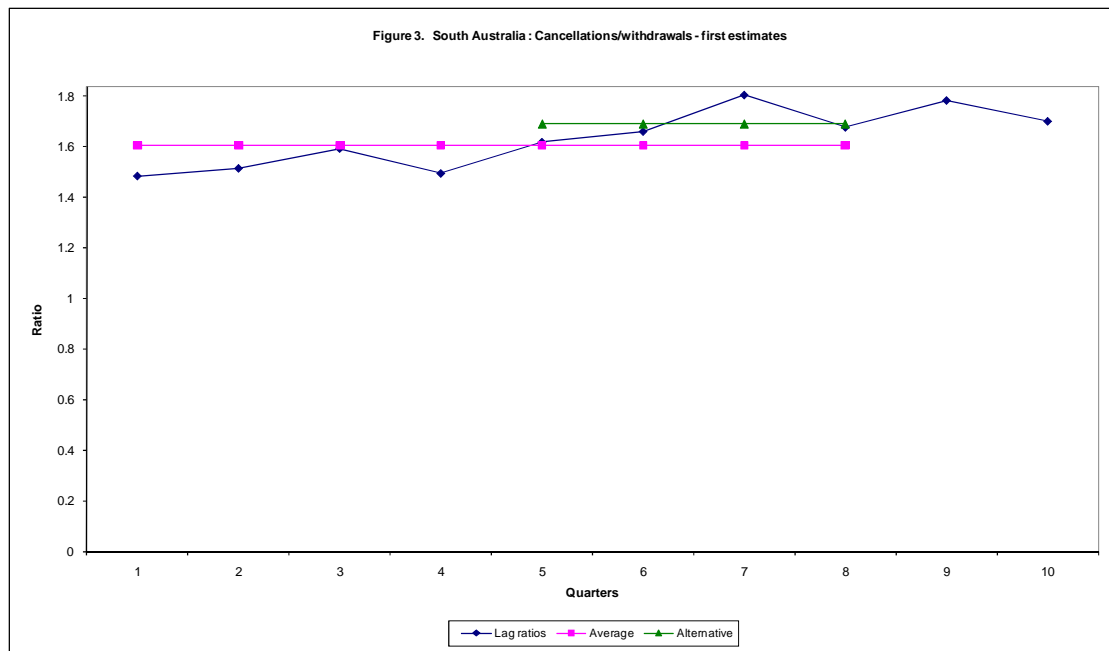
Revised Estimate = 1,685

## Attachment 1: Revised Estimates for Collection 60

The following graphs depict the pattern of the lag ratios for the estimates that were revised. The graph shows the lag ratios for the eight quarters in the time window used in the endorsed model (labelled 1 to 8) and also the two quarters following (labelled 9 and 10).

Horizontal lines are also displayed on the graph. One represents the average lag as calculated from the lags in the time window (pink line). Where there is another, it represents the average lag as calculated from the alternative time period used for the revised estimate (green line).

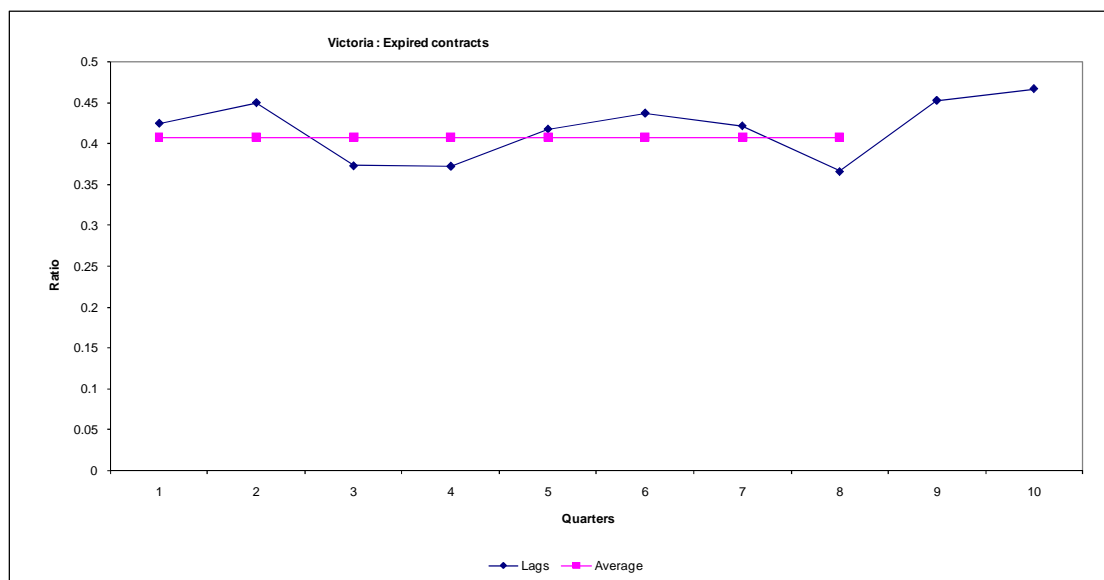
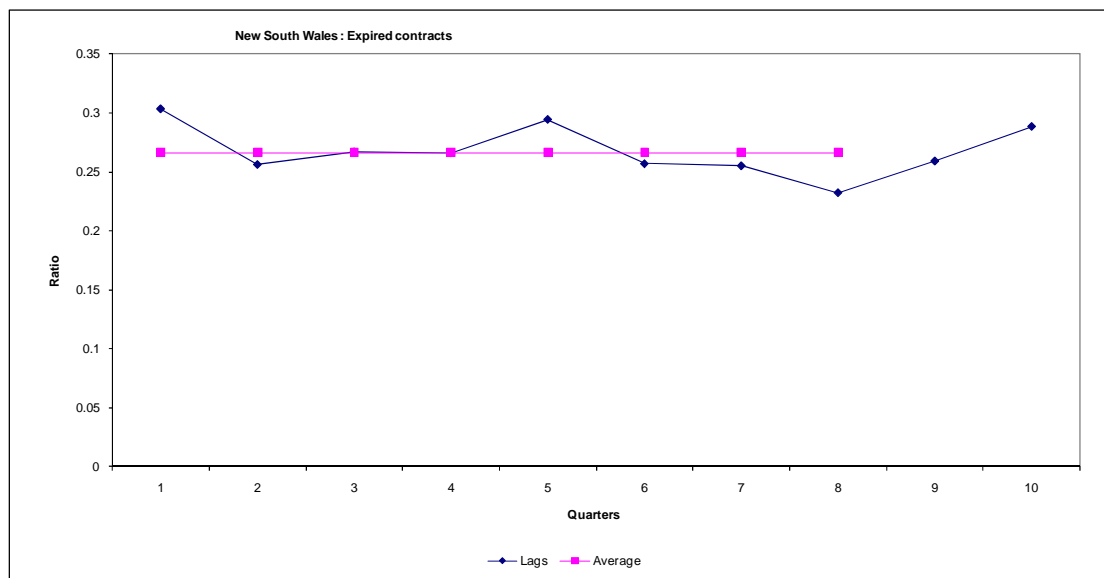


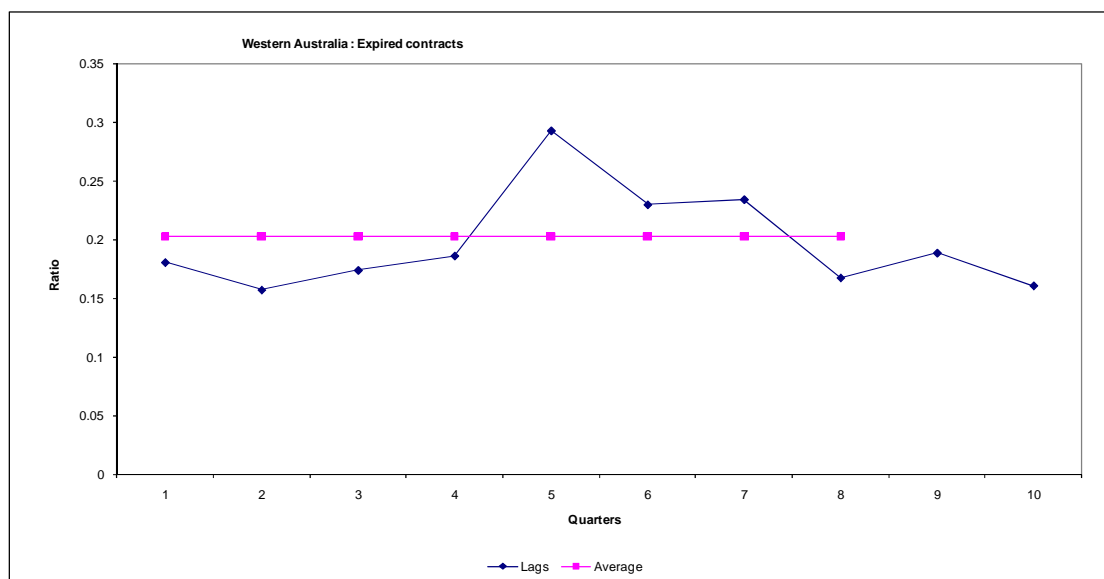
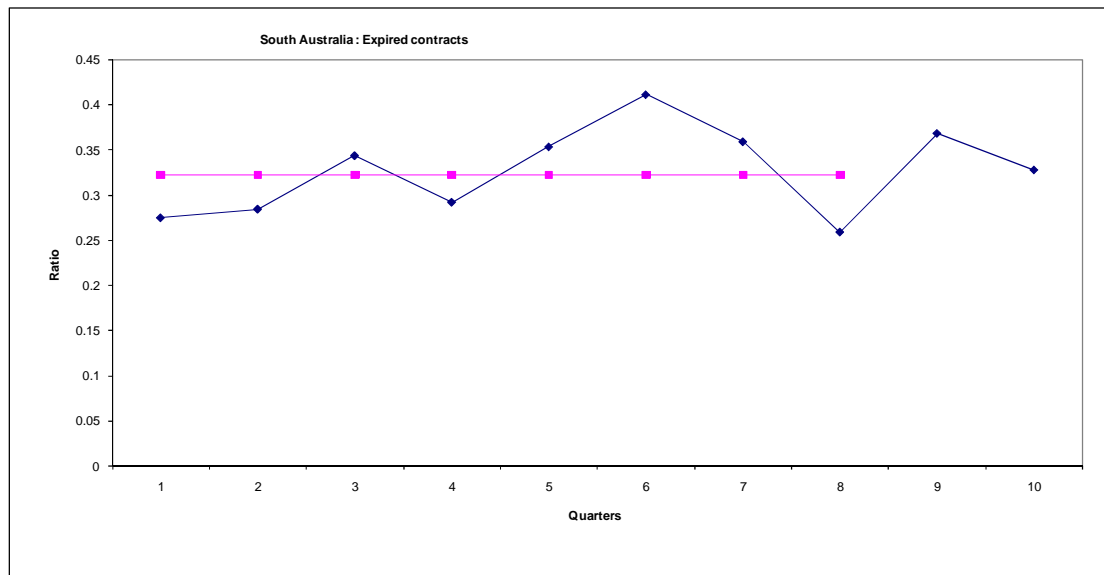
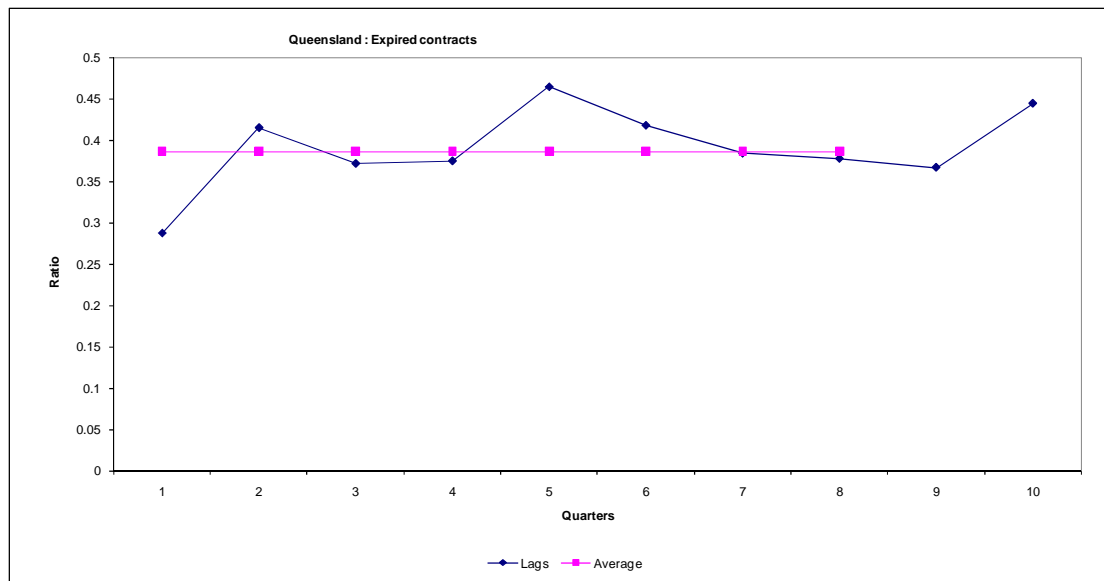


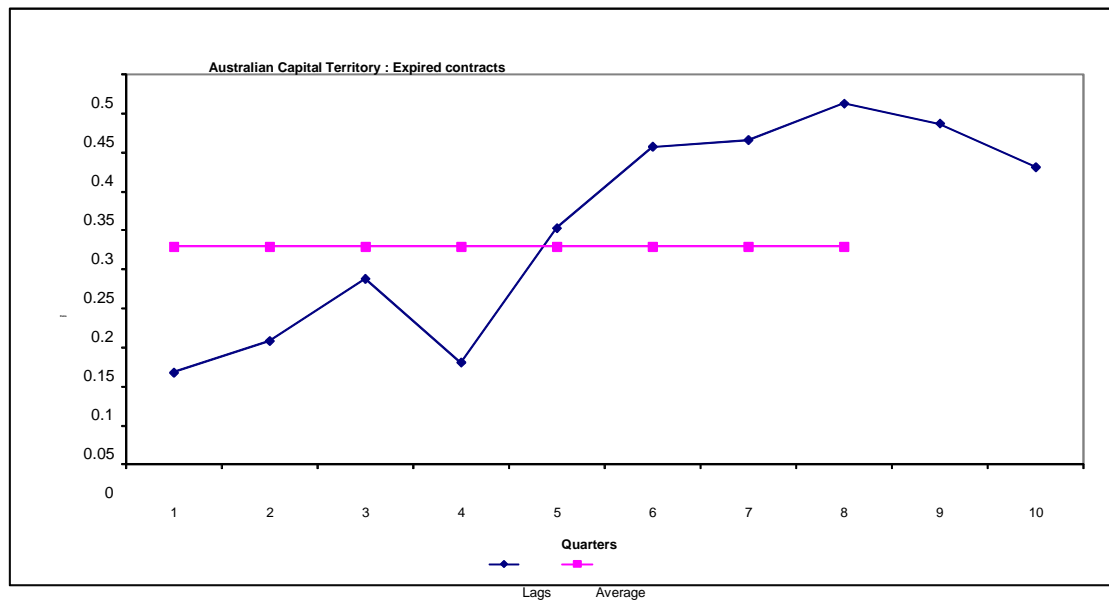
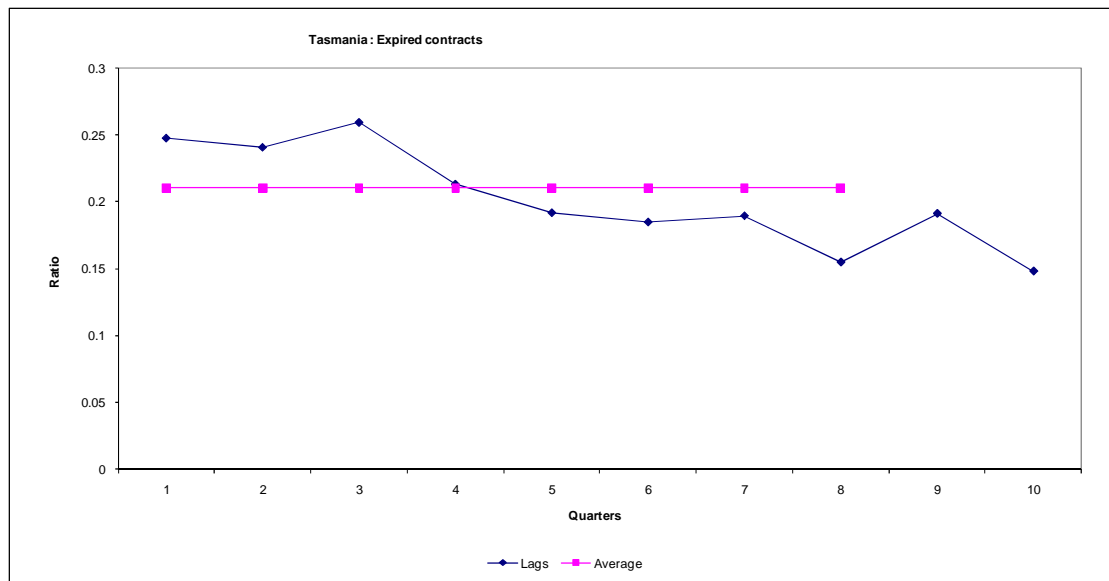
## Attachment 2: Expired Contracts for Collection 60

Although subject to high relative errors, estimates of expired contracts have not been altered because they are such a small contributor to the in training estimate. The following graphs depict the pattern of the lag ratios for the estimates of expired contracts. As can be seen from the following graphs, the pattern of the lags does not always suggest an alternative way of estimating expired contracts.

The graphs show the lag ratios for the eight quarters in the time window used in the endorsed model (labelled 1 to 8) and also the two quarters following (labelled 9 and 10). A horizontal line is also displayed on each graph, representing the average lag as calculated from the lags in the time window (pink line).







# References

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Harvey, B 2009, *Estimation of Apprentice and Trainee Statistics*, NCVER, Adelaide.

This paper can be found at <<http://www.ncver.edu.au/publications/2213.html>>.